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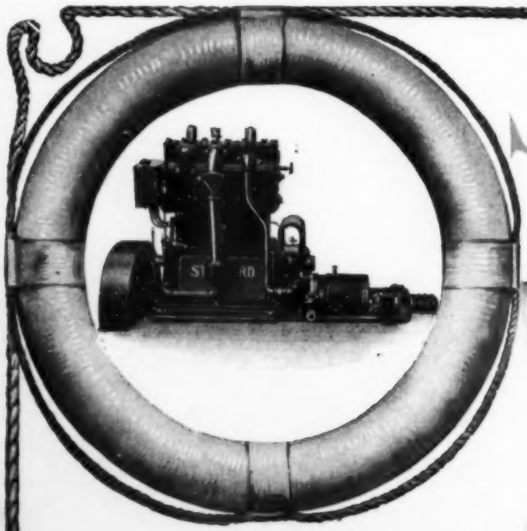

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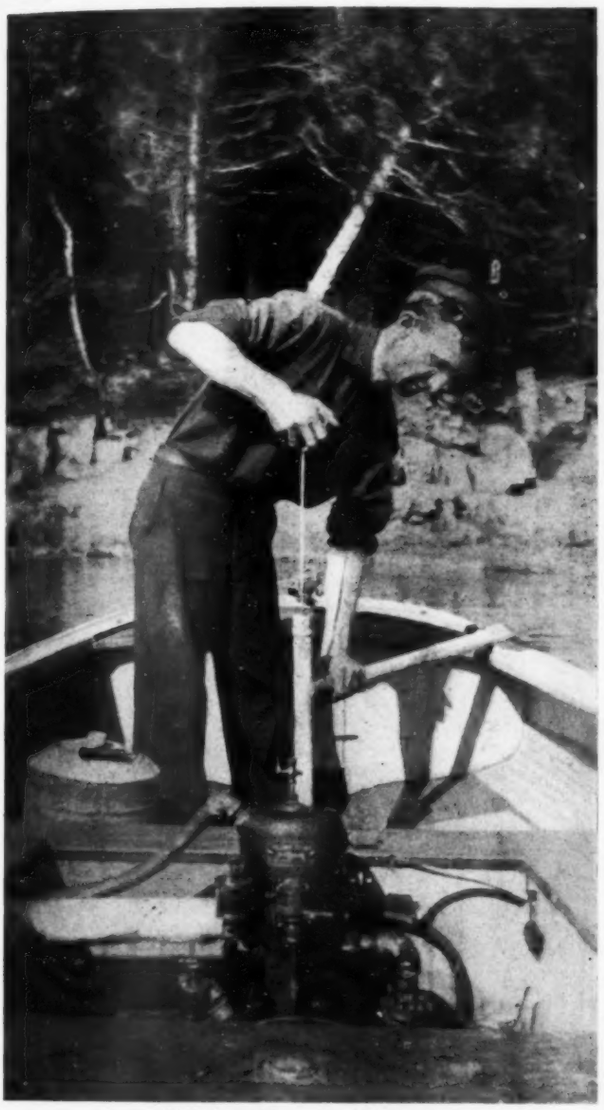

After launching—the bilge pump.

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A Rock-Bound Coast.

MOTOR BOATING

THE NATIONAL MAGAZINE OF MOTOR BOATING

The Philadelphia-Havana Race.

Six Boats Compete in the 1400-Mile Ocean Race of the Yachtsmen's Club of Philadelphia. The Conditions for the Race, The Contesting Boats, Their Crews, The Course and Trophies.

By Chester L. Wynn.

WITH the appearance of this issue of MOTOR BOATING, six cruisers ranging from 50 to 75 feet in length are racing along the line of the Gulf Stream from Philadelphia to Havana in one of the biggest events in marine competition for the year 1910. It is a race that will probably result in changing if not revolutionizing many ideas concerning the deep sea navigation of motor boats, before the 1400 mile course is run. The lessons learned in the Bermuda races are being put to use and new tricks are being learned by the amateur and the professional navigators who are piloting the boats on the long run.

While all the yachting men interested in the race agree that the knowledge of the navigators of the boats will have considerable weight in the winning of the race, they are a unit in the belief that luck in the selection of the right course will have a big bearing on the result. The Gulf Stream will have to be crossed and recrossed. Storms may be encountered by one of the contestants that will not be sighted by others. The trials of the craft that entered in the Bermuda races show that the 50-footer has little to fear along the Gulf Stream. In last year's Bermuda race the 50-foot Ilys, which is one of the contestants on the Havana run, braved a Nor'easter in her trip across the stream that severely damaged and handicapped the larger boats. A big steam yacht which was in the same waters at the time had her bulwarks torn off and her deck houses wrecked while the passenger steamers plying in the coasting trade practically hove to. The lessons that are being learned in this Havana race are surely not of the text book variety nor are the navigation nuts that are being cracked similar to those encountered in nosing into inshore coves.

The three trophies and the course of the Philadelphia-Havana Race.
Above, the first prize, donated by the Yachtsmen's Club of Philadelphia; on right, the second prize cup, and on left, the third prize, donated by Alexander Van Rensselaer.

The lack of trying out and preparation has ruined the chances of winning of many boats that have entered ocean races, but it is hard to believe that any of the contestants will plead such an excuse for not carrying off one of the beautiful trophies provided as prizes for the winners of this race. Boats, engines and crews have been thoroughly tried and overhauled. A maximum of enthusiasm and a big stock of enterprise figured in the launching of the race by the Yachtsmen's Club of Philadelphia under whose auspices it is being run and if these go for anything the success of the race is assured. The enthusiasm of the Havana yachtsmen who are working in conjunction with the Philadelphia motor boatmen is just as great and the arrival of the boats at the finish between the lights of the Moro and La Punta, the picturesque forts on the East and West of the entrance of the Havana Harbor will be the signal for a holiday fete being begun by the major portion of the residents in that section of the island.

While the course of the race is much longer than any previously undertaken by power cruisers, it has the advantage over the Bermuda course, its nearest competitor, in that at no time will the craft be over 100 miles from a harbor in the remote case of a complete breakdown of the motive power. No matter which side of the Gulf Stream is taken, the navigators will at all times have the assurance that they are in the line of considerable coastwise shipping and that they, equipped as they are with sails, can be easily sighted and thus placed in touch with the land via the wireless of those vessels. One of the requirements of the race committee was that stores sufficient for 30 days be carried, and most of the owners made provision

for carrying sufficient fuel to last them until Havana is reached, but if any of these arrangements should be not far-reaching enough the boats can put into any of the numerous supply stations along the coast and yet have a chance to win the prize.

The boat which wins the Havana race can probably rightfully be called the mistress of the seas from the power boat standpoint. They are all good yachts, none being more than a couple of seasons old and all built for general seaworthiness. Ilys, of Bermuda race fame; Caliph, Georgiana II, Loantaka and Caroline, which were the first five entrants in the race, were described for the readers of MOTOR BOATING in the April issue. Berneyo, owned by W. S. Granberry of New York, is the sixth entry.

Ilys is the 50-footer owned by Commodore J. G. N. Whitaker, of the Yachtmen's Club of Philadelphia, who, with Thomas Fleming Day and Commodore Carlos F. Carbonell, of the Havana Yacht Club, is in charge of the race. Many of the members of the Yachtmen's Club are backing her to win the race, but they are divided to some extent by the entry of a new boat, Caliph, which is owned by Martin E. Brigham, Commodore of the Ventor Yacht Club. She embodies many of the ideas gained through experiences with Ilys, which is after a manner a sister boat, and equipped with a 36 h. p. Hall engine.

Caroline, a New York entrant, has proved her seaworthiness

She is owned by M. Frank Dennis, and was designed by Whittelsey & Whitaker. She is 65 ft. over all and is equipped with a 25-horse-power Standard motor.

Caliph, another entrant, embodies many ideas gained through experience with Ilys.

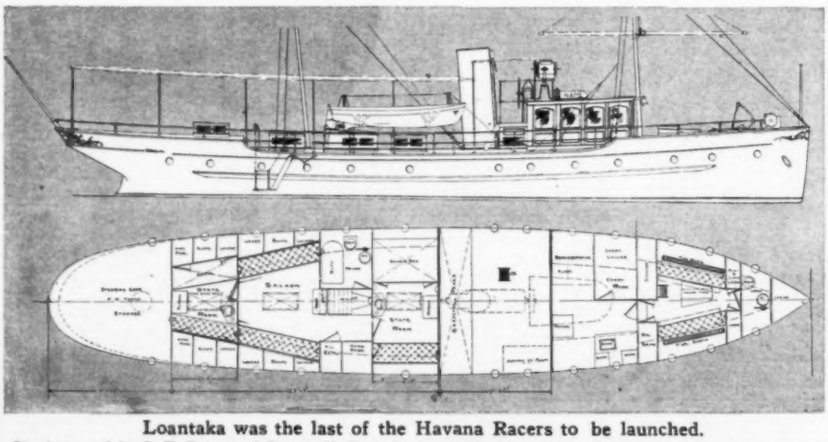
Caliph is owned by Martin E. Bingham, Commodore of the Ventnor Yacht Club. She was designed by Bowes & Watts and was launched on April 19th from the Camden Yard of the J. H. Mathis Company. She is 60 ft. over all, with 11 ft. 6 in. beam and 3 ft. 6 in. draft, and is equipped with a 36 H. P. Hall motor.

Another Philadelphia boat in the race is Georgiana II, which is owned by W. G. Coxe, of the Corinthian Yacht Club of Essington. She was designed by her owner and A. H. Main, naval architect, primarily as an ocean racer. She has never entered into the big races before and is somewhat of a dark horse as to her true worth in the deep seas.

Loantaka, which is owned by J. F. Peters, of Dover, N. J., is being navigated in the race by Warren Sheppard, who is well versed in the arts of the nautical instruments and has sailed in the Bermuda, Marblehead and Cape May races for a number of years. It had been expected that at least three New York boats would be entered in the race, but Caroline, owned by M. Frank Dennis, and Mr. Granberry's Berneyo were the only ones to materialize. With Walter Beiling as captain and navigator of the Caroline, all grant that she is in the best of hands.

A tentative course for the boats to follow has been charted, but it is hardly probable that any of the navigators will stick to a beaten path if there is any. Captain B. D. Reese, teacher of navigation at the Yachtmen's Club, who is piloting Ilys, announced before the race was started that he will take a route which will keep close to the coast route. On the other hand, some of the navigators have decided to go outside the Gulf Stream for a considerable part of the way. The charted course leads from Race street wharf on the Delaware down to Cape Henlopen and over this leg yachtsmen have little trouble in finding their way to the sea. It is well buoyed and lighted. From Henlopen the course shapes almost due south for 223 miles to the Diamond Shoals Lightship anchored off Cape Hatteras. At no time while on this part of the course is the land over 40 miles away and it lies over sounding.

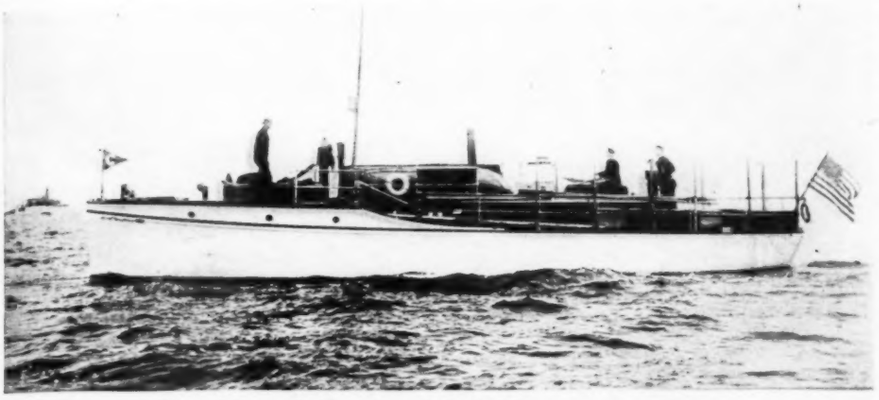
At Hatteras the majority of the boats will cross the Gulf Stream for the first time and take a course S.S.W. ½ W. a distance of 545 miles to Jupiter Light at the entrance of the famous Florida straits. On this straight stretch from Diamond Shoals to Jupiter Light the greatest distance from the shore will be experienced when the boats are due east of Savannah 190 miles. Just northwest of the Bahamas



Loantaka was the last of the Havana Racers to be launched.

She is owned by J. F. Peters, of Dover, N. J., and was designed by Thos. D. Bowes. Her length over all is 73 ft., her beam 14 ft., and her draft 4 ft. 6 in., and she is equipped with a 70 H. P. Reeves-Graef engine.

the Gulf stream is crossed the second time on a bias to the Jupiter Light. There the course turns S. ½ W. 102 miles. The straits are 45 miles across, which is taken up almost entirely by the Gulf stream, and this stretch is probably the most difficult of the entire run to navigate. The general impression is that the two miles nearest the Florida coast are the easiest to run on the down trip even if it is hazardous to skin the Florida reefs so closely. The reef is well lighted, however, and by keeping the stilt beacons close to the starboard hand sufficient water for any craft is assured.



Ilys of Bermuda Race fame is backed by many as a winner.

Ilys is owned by Com. J. G. N. Whitaker, of the Yachtsmen's Club. She was designed by Thomas D. Bowes, of Philadelphia and was built by J. A. Vanderslice at Camden, N. J. Her dimensions are 50 ft. over all, 10 ft. 6 in. beam and 3 ft. draft, and her engine is a 25 H. P. Hall.

After passing the Carysfort Reef Light the course shoots straight across the Gulf stream, S.W. 175 miles to Havana.

The tonnage of provisions, fuel, etc., which was stowed away in the cruisers is almost unbelievable. The problems of stowing them away in such a manner as to leave the boats comfortable and yet have them thoroughly lashed, were difficult ones. The average 30 or 40 horse power engine will burn about 1,100 gallons of gasoline on the trip, or, in other words, it was necessary to stow away about three tons of the fuel, which was a difficult proposition to handle. Aside from this each boat had to carry about 60 gallons of lubricating oil, which was put up in one-gallon cans because they are easier to handle in a sea-way than the larger ones. In this race provisions and water for thirty days must be carried for the whole crew, which means that about a ton and a half of provisions and a half ton of water must be put away somewhere below decks. The figures on the amount of gasoline that the cruisers will carry in the race are interesting. The Ilys carries the least of all the boats and has most of it stored away in her tanks. In all she was stocked with 900 gallons, 810 of which were placed in the tanks and 90 gallons placed in 5-gallon cans. The Berneyo and the Caroline had 1,100 and 1,200 gallons respectively, two-thirds of which was placed in tanks. The Caliph had 1,300 gallons on board, 940 of which was in tank and 360 in 5-gallon cans, while the Loantaka had 720 gallons in her tanks and 780 stored away in the smaller cans.

Every effort was made by the race committee to make the boats easy to be distinguished while on the ocean. All will fly the Coston night signal of the Yachtsmen's Club of Philadelphia, which is "red, green, white, green," and aside from these marks on the bow each boat will carry a distinguishing signal on the stern. The boats have been numbered as follows: Ilys, 1; Caliph, 2; Caroline, 3; Loantaka, 4; Berneyo, 5; and Georgiana II, 6, and will carry distinguishing signal lights respectively as follows: White, red, green, blue and yellow, with Georgiana II carrying no light.

Georgiana II has never raced before and is somewhat of a dark horse.

Georgiana II was designed by her owner, W. G. Coxe of the Corinthian Yacht Club of Essington and A. H. Main, and was built last year by the Harlan & Hollingsworth Co., of Wilmington, Del. She is 70 ft. over all, with a beam of 12 ft., and draws about 4 ft. 6 in. Her 60 H. P. Craig drives her at about 14 miles per hour.

Ilys will have as master her owner, J. G. N. Whitaker, and will be navigated by Captain B. D. Reese. Her deck crew consists of C. L. Lagen, M. G. Belknap and W. A. Winterer, and the engine room will be taken care of by Theodore Presse and T. W. MacKensie. The crews of the other boats are as follows: Loantaka, H. S. Peters, owner and master; Warren Sheppard, navigator; J. W. Sheppard, Dr. C. S. Street and Percy Cook, deck crew, and Chris Miller, Thomas Teasdale, Hiram Weller and John Price, engine crew. Caroline, M. F. Dennis, owner; Walter M. Beiling, master; Thomas Fleming Day, navigator; Fred Thurber, Joseph Kerr and M. W. Whitaker, deck crew, and John Sillon, chief engineer. Berneyo, S. W. Granberry, owner and master, captain and navigator professional and Alexander MacDonald and Fred Williamson, deck crew. Caliph, Martin E. Brigham, owner and master; Captain C. Loveland, navigator; P. P. G. Hall, chief

(*Continued on page* 94.)

Berneyo is one of the two New York boats entered in the Havana Race.

She is owned by Mr. Granberry, was designed by Edson B. Shock, and was launched on May 4th at Alexander McDonald's yard, Staten Island. She is 60 ft. over all and is powered with a 25-horse Standard.

Making the Small Lakes Safe.

A Great Many of Our Smaller Inland Lakes are Dangerous Places for the Fast Motor Boat. What the Improvements at Belgrade, Maine, Have Done for Motor Boating.

PART II.

By E. S. Lincoln.

IN the first installment of this article which appeared in the May issue, was considered the problem of making our small lakes suitable places for the motor boat, which has created a situation which did not exist when row boats and sailboats alone traversed these waters.

As an example of what may be done in the line of improvement, Great Pond, one of the Belgrade chain of lakes, has been considered, as the problems it presents are varied and cover most of the conditions that are met with elsewhere. In the last issue, the methods of buoying submerged reefs, rocks and other obstructions, were discussed together with the construction, fastenings and moorings of the buoys themselves.

Moorings. Figure 8 shows two methods of fastening the buoy chain to the rock. The through-bolt method is the better of the two, but requires more work to be attached. A one-half inch galvanized bolt should be used. Another method shown in the same figure, commonly called the "wedge method," requires much less drilling in the rock, and when properly done, it serves its purpose, but has the disadvantage of splitting the rock if its structure is not perfect. The chain should be fastened to the buoy and rock by means of a galvanized iron machine bolt, as shown in Figures 6 and 8. Just before the buoy is put in place, and the chain has its proper length, the threaded end of the bolt should be headed over to prevent the nut from coming off.

Placing Buoys. This should be started by first locating the proper spot for the buoy, and putting down a small pilot buoy, which may be simply a small piece of wood attached to a rope and sinker. A calm day should be selected for this work. After making sure that the pilot buoy is properly located, its depth is noted by means of a sounding line, and the chain length adjusted so that the buoy will float nearly upright. At Belgrade, the best results were obtained by placing the buoy as close as possible to its mooring rock, but this, of course, depends upon the depth of water, and the length of buoy. It was also found that, one-half the length of the buoy plus one foot below the surface of the water, gave best results. This would mean that a twelve foot buoy would have seven feet below and five feet above the water, and a fifteen foot buoy would have eight and one-half feet below and six and one-half feet above the surface. However, this will depend upon the diameter of the buoy, and the material of which it is made. By a little experimenting, the proper depth of immersion is easily obtained.

A foot at the top of the red and black buoys was painted white to make them more easily discernible at night.

A small flag buoy employed to mark a local rock.

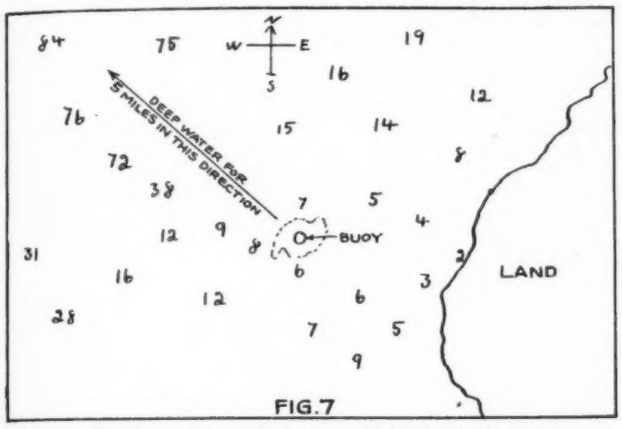
In all lakes there is a variation in the depth of the water, which is very noticeable where the lake acts as a feeder for industrial purposes. At Belgrade, the lake drops from two to three feet each season, and sometimes more, depending upon the rainfall during the season. For this reason the buoys are placed so as to be at their proper angle, at the average depth of water, and the result is, that at the first of the season, the buoys stand upright and are visible for a less distance, as their height above water is decreased. This is not so objectionable as it might seem, for with an increased depth of two to three feet, the dangers are farther away from the boat. When the water level drops, more of the buoy is exposed, and as the declining water passes the center of gravity of the buoy, it gradually slants, therefore, the more it slants the more precaution the navigator should take in running his boat. A slanting buoy is easier to see than one perfectly upright.

It requires three men and a steady motor boat, to properly place buoys of the type previously described. A row boat will also greatly help out in finding the location for the buoy. The buoy itself may be laid across the boat and its mooring allowed to hang over the side, if a short chain is used. When a buoy is launched, be sure that everything is free, so as not to cause injury to the boat or those handling it.

One of the worst conditions for a buoy is shown in Figure 7. In this case the strong winds blow from the northwest over a five mile stretch of deep water, and the buoy is in a comparatively shallow location, and much exposed to the action of the waves. However, a good substantial rock will keep the buoy where it belongs. In this particular case, a rock weighing two hundred pounds was found sufficient.

In Figure 9 is shown a typical buoy and light installation, which will protect navigators from existing dangers. This illustration is taken from a problem at Belgrade the solution of which has proved very effective and valuable. At "B" on the right of Figure 9, there is to be added a blue light, visible for two miles, which will add greatly to the safety of the boats that are obliged to take the course down the lake.

Lights. The question of lights is an important one for lake use. However, it is easily looked after if the conditions are known, and the facilities are at hand. After experimenting with different types of lights, colors, and oils for burning, it was found that a 360° Bridge light was best adapted to the



It is difficult to moor a buoy successfully in shallow water.

conditions. Red and green are better suited for the colors of the lights, as they are easily distinguished. White lights are not recommended on lakes, as they are so easily confused with lanterns on the shore, or a light in a house or camp. By this is meant that red and green should be used purely for navigation lights, and leave the white lights for marking wharves, and local dangers near the shore of the lake.

The red light is used to mark isolated dangers, while green lights protect reefs and shoals, extending from the mainland. In most cases a six inch bridge lantern will give ample light, but for a large lake the eight inch light is to be recommended. These lights cost from $9 to $12 each, and are very substantially built, and not affected by the elements in any way.

The lantern should be placed at least eight feet from the surface of the water. At this height, it will be visible for at least one mile, and a greater height will give a greater range.

Figure 11 illustrates a satisfactory method of fastening the light and its support into a rock. Figure 10 shows an eight inch bridge-light mounted on a large rock.

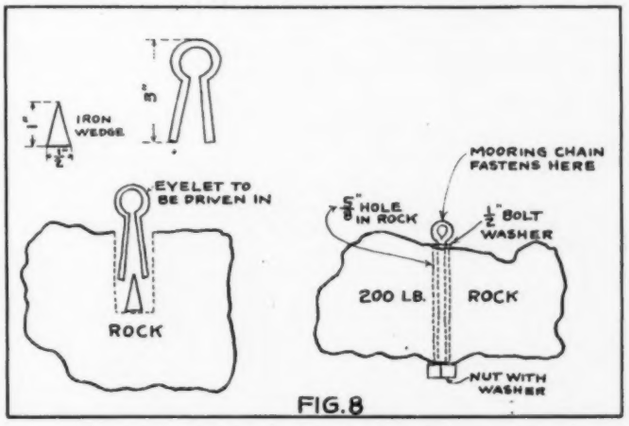
These lanterns burn a special signal oil, and require filling and trimming every four days. They will burn five days, but it is better practice to fill them every four days, in case of a storm on the fourth day, they can be left for another twenty-four hours. The lens and chimney should be cleaned each trip, and the wicks properly trimmed. It is good practice to paint the metal part of the lamps white, as it makes them easily distinguished in the daytime. Lights should be located where navigation is frequent at night, and in most cases only a few will be found necessary.

Making a Chart. After the lights and buoys have been properly placed, it is a comparatively easy matter, to make a small chart of the lake. This is easier if an accurate map of the shore line is obtainable. All the instruments that are necessary to make this simple chart are a reliable liquid compass and a small brass telescope. The latter should be attached to the compass and be directly lined up with its lubber-line. Before taking any readings, a small white flag should be placed on all important points of land that show on the map, as it would be called before converting it into a chart. A note book should be used and readings put down as they are taken.

At one of the land stations, place the flag as near as practical and sight all the buoys possible, noting the compass readings to same. By going to these thus sighted buoys in a boat, and placing the compass on top of them, the readings can be checked and errors thus eliminated. It is important that all iron be removed from the proximity of the compass.

To give a better idea of this simple method of chart making, an examination of Figure 12 will be helpful. First we would start at station "A" and take the compass reading to station "C," and then to buoys "B" and "D." Now by going to land station "C" the reading to "A" can be checked. Further readings taken to buoys "B" and "D" and also "E" and "F" are also recorded. Now by going to each one of these buoys the readings of the land stations may be checked. It is, of course, necessary to get at least two readings on each buoy in order to locate same. A fast motor boat and a row boat will make this work much easier, where the distances are considerable.

After all the readings are taken the land stations are marked on the map, and the readings of the compass laid out. It is necessary to have a compass card corresponding to the com-

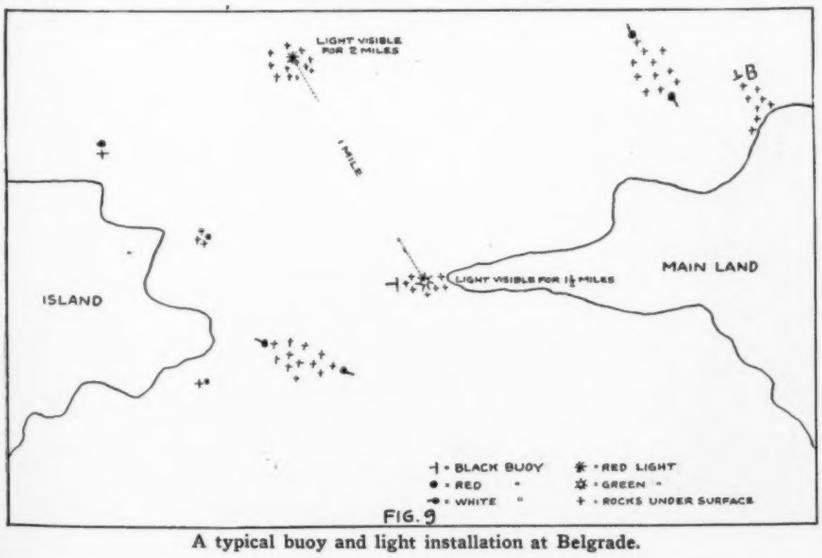


Two methods of fastening a buoy chain to the rock.

pass needle put on the map. This can be done by taking a number of readings between several land stations, and plotting them on the map. If the map is anywhere near accurate these will check up very well. In this way the main points of the compass are obtained and the rest are easily filled in. By means of a parallel rule all the compass readings of the different buoys and lights can be plotted, and where the lines intersect, the object is located.

This simple method was used by the writer at Belgrade, and afterwards an accurate survey of the lake was made, with result that the "compass chart" was found to be very nearly accurate. The accuracy, however, depends upon the carefulness of the parties doing the work, and the accuracy of the original map. Soundings will add greatly to the chart, but are very hard to locate without special instruments. In deep water only a few soundings are required, but in channels and important passages a number are necessary, to be of any value. The simplest way to take soundings is to take compass readings from the boat to two or more of the fixed stations. It should be remembered that the compass must be kept away from all iron and steel and especially from the engine.

In 1908 an association was formed at Belgrade and the buoys and lights were placed in charge of a special committee. The object of this association is to look



A typical buoy and light installation at Belgrade.

after the interests of all concerned in regard to the lake itself, the fishing and the navigation. The result is that one unfamiliar with the lake may drive a motor boat in perfect safety as far as navigation rules can be of service.

In the important channels the association has removed the rocks and widened the passages and the expense of such work

Fig. 10.—An 8-inch Bridge light was found best suited for the work.

has been divided among all motor boat owners and others who are interested in the work of improvement.

Unless there are enough motor boats to pay for such improvements there is of course little necessity for them, there being no congestion. But at a place where there are many motor boats the total cost of such protection is far below the cost to the boats that are damaged every year, to say nothing regarding other risks. The cost of maintaining the buoys and lights is very small when the work has been properly done in the first place and the materials carefully selected.

The following is copied from a small booklet published by the Belgrade Great Pond association and will prove of interest to those who are interested in the development and improvement of our inland bodies of water.

NAVIGATION RULES.

Lights. Every motor boat is requested to carry the following lights while under way between the hours of sunset and sunrise: A WHITE light at its bow, a GREEN light at the right, and a RED light at the left of the white light. It is recommended that motor boat owners use the common launch light of the combination form. The above lights should be screened from the rear of the boat, and should only be visible from the sides and bow. If a boat is obliged to stop while on the lake and away from either wharf or mooring, the occupants must keep a lookout for other boats, and exhibit a light when one approaches. If a boat is anchored out, it is requested that a white light be left on same.

Whistles. All motor boats are requested to carry some form of whistle and adhere to the following rules: One blast signifies, "Am directing my course to starboard" (right). Two blasts signifies, "Am directing my course to port" (left). Three blasts is merely a salute, or "How do you do". Four blasts signifies distress, "Am in need of assistance; please help me out." Five short blasts signifies, "I do not understand your signals, please repeat."

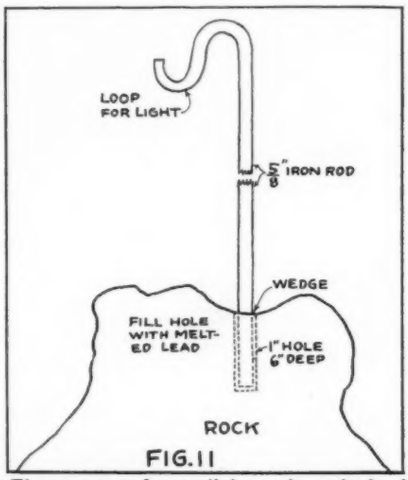
Right of Way. A sail or row boat has the right of way over motor boats, but should keep in shallow water in the narrow passages. Boats entering the stream at Belgrade Lake Village have the right of way over boats coming out. While in this stream boats should always keep to the right. When two boats are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard (right) side shall keep out of the way of the other.

Buoys. RED buoys are placed on rocks and may be passed on either side, keeping a safe distance from the rock. BLACK buoys are placed on the reefs or shoals, and should always be passed seawards. They are placed in deep water at the extreme end of such reefs and shoals, and may be passed close by. The reef or shoal extends from the island or mainland, as the case may be. WHITE buoys mark reefs or shoals that do not connect with the mainland. These buoys are placed in pairs, one at each end of the shoal or reef. NEVER PASS BETWEEN TWO WHITE BUOYS. NO BUOY IS EVER TO BE USED AS A MOORING.

Lighted Beacons. From June 1st to September 15th, the following navigation lights will be maintained: At the Ledges, a red light, visible for two miles. At north end of Long Point a green light, visible for one mile. On the southern end of Ram Island or Joyce's Island, a white light and a red light. At the entrance to the stream to the Belgrade Lake Village, a red light, visible for one mile. There are also a number of white lights located at the various camps around the lake, but they should not be depended upon, as they are not maintained by the Association.

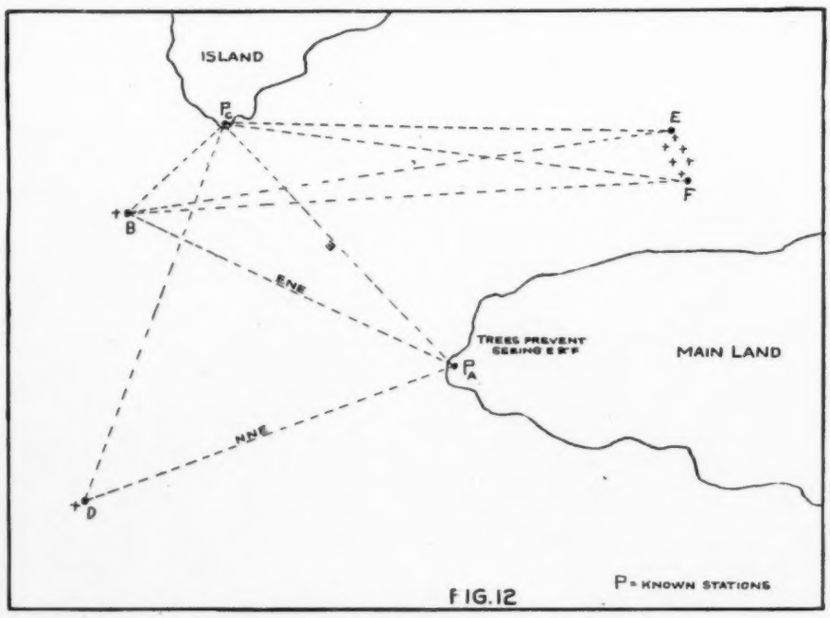
Recommendations. A row or sail boat needing assistance may signify same by raising an oar.

It is recommended that all power boats carry some form of life preserver.



The support for a light and method of fastening it to the rock.

As was previously stated the conditions at Belgrade were dangerous, a great deal more so than is the case with the average small lake; and therefore the work required and the expense necessary were correspondingly greater. Considering, however, that the total cost of putting the lake in its present condition has not been large even when the cost of the experiments that were necessary has been included; and considering that the work withal has been a pleasure it is the writer's hope that the experience at Belgrade will encourage the undertaking of similar work elsewhere and that these suggestions may be of service in accomplishing that work.



When the work of buoying and lighting the lake was finished, a chart was made.

Intruder's designer guarantees for her a speed of 36 miles per hour and it looks as though she would go above that figure.

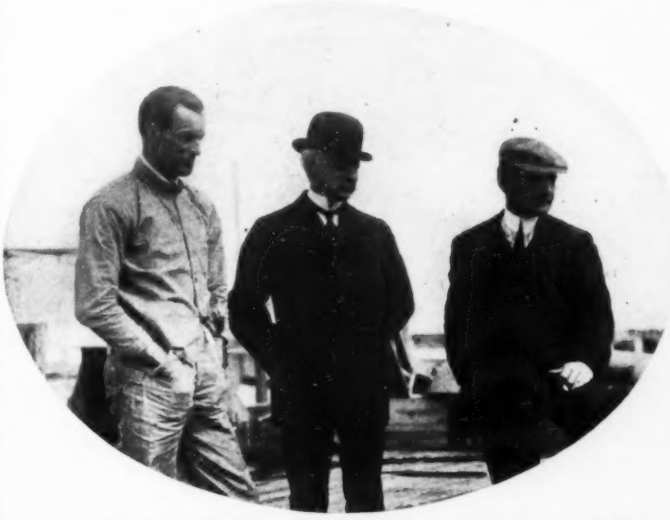
"British International" Developments.

Intruder, A Probable Running Mate for Dixie III, Hope-Rathborne Hydro Not to be Sent. Duke of Westminster, Thornycroft and Orleans Company to Send Boats.

IT is reported from across the water that the much-heralded Hope-Rathborne hydroplane will not be built, at least in time for the British International. The Englishmen, however, are determined in their efforts to win back the "Prix d'Honneur," held by Dixie, and there will still be a trio of challengers, as it is understood that, besides the Thornycroft hydroplane and the racer being built by the Orleans Motor Company, the Duke of Westminster will send a boat. It will be built somewhat on the lines of the famous 40-mile Ursula, of Monaco fame, but with an underbody built on the principle of the Fauber hydroplane. She probably will be equipped with one of the 8-cylinder 300 h. p. Wolseley motors, as installed in Wolseley Siddeley I.

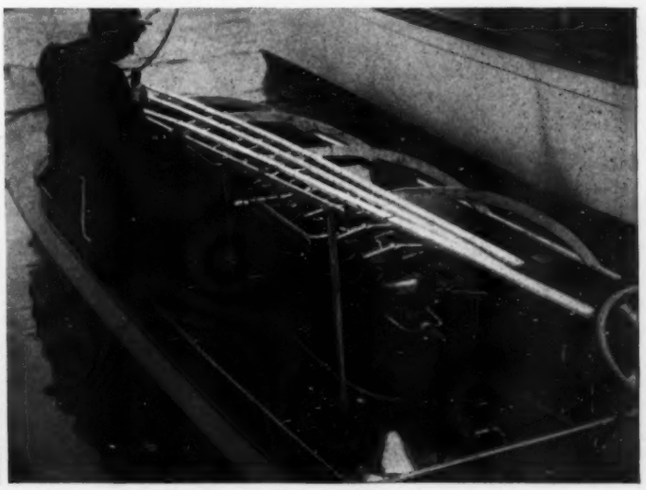
Sir John Thornycroft's Hydroplane is now nearing completion, and is a development of the 30-mile hydroplane Miranda III. She must have possibilities as Sir John, always conservative, has estimated her speed at 40 miles per hour. Regarding the Orleans boat she will carry the engine that was installed in Maple Leaf II, the unfortunate, untried Monaco racer.

As to developments on this side of the water, the Motor Boat Club of America has been quite active of late, and as Mr. Frederick K. Burnham has been elected to the office of vice-commodore of this organization, it is safe to predict that not only Dixie III, but also the new Intruder, will be entered as defenders. Intruder was designed by Henry J. Gielow, and has just been launched at the Jacob Yard at City Island. Her designer guarantees a speed of at least 36 miles per hour, and it looks as though she would go considerably above that figure. She is 39 ft. 11 in. over all with same water line length, her extreme beam is 5 ft. 6 in., and the draft of her hull is about 10 in. The accompanying photographs were taken recently at City Island during her trials.



Messrs. Burnham, Gielow and Jacob, owner, designer and builder of Intruder.

Intruder is equipped with an 8-cylinder 240 horsepower Sterling engine, and a specially designed propeller.



Tuning up Intruder at the recent trials held at the Jacob Yard, City Island. On the right is shown her 8 cylinder, 240 horse motor.

Fitting Out for the Cruise.

A Number of Suggestions As to the Equipment and Stores Necessary for Such a Trip. What the Writer Has Learned From His Experience On Many Motor Boat Cruises.

By Allan O. Goold.

WHEN at length the seemingly endless winter and spring have dragged their weary length to that region from which no time returns, the motor boatman suffers an accession of the cruising fever from which his blood is never entirely free. If he is one of that great class whose vacation is two weeks long he has probably planned and replanned a cruise which will use up those precious fourteen days even unto the last minute.

Of course his boat has been in commission since the first buds appeared on the trees and he has doubtless put in many day trips to favorite spots about the bay.

Still a real cruise demands more of the boat and its owner than any number of sails when the weather has been carefully chosen and when long runs or real cooking are seldom undertaken.

Before the eventful time arrives the owner should try to have both his hull and power plant in the pink of condition for it will not do to endanger the success of the long anticipated outing through the failure of some minor hull or engine part at a critical moment. The boat should if practicable be given a coat of paint above and below the waterline and the bright work may also receive a coat of varnish. The craft should be a credit to her home club and her owner when visiting the waters of "foreign" motor boat clubs.

The motor should receive all the attention necessary to insure its consistent performance on long continuous runs. The valves may require grinding or some of the bearings may be worn and require refitting. Do not leave your mooring without an ample supply of duplicate springs and engine parts which may have to be replaced when machine shops are miles away.

Carry in a drawer or locker in the engine room an outfit of serviceable tools with which you can put up a satisfactory job of rough-and-ready repairing in case of a breakdown. A medium size machinist's vice will be found a great convenience if space can be found for it. This vice should preferably be clamped to a small work bench underneath which may be located the lockers or drawers containing the tools and spare parts.

Engineers differ greatly regarding the outfit of tools which should be carried. Some men venture on long trips with hardly more tool equipment than they carry in their pockets, while others reach the other extreme by carrying a complete stock of taps and dies, reamers and drills which would grace the shelves of a factory tool room.

Between the two extremes is the outfit which is reasonably complete and still not cumbersome and which will prove all that can be desired on cruises of any length. On no account purchase cheap tools with the idea that since they will be used but seldom almost anything will be good enough. The time for making emergency repairs is usually short and the conditions far from ideal. The tools no matter of what nature should be of the best material and workmanship obtainable, since in the hurry and excitement of rush repair work the strain upon them is often far greater than they are designed to withstand.

The following list will be found sufficient for the average cruiser of moderate size:

One 12-inch monkey wrench, one 8-inch monkey wrench, one 24-inch Stillson wrench, one 10-inch Stillson wrench, one 8-inch adjustable S wrench, one 6-inch screw-driver, "perfect handle"; one 10-inch screw-driver, "perfect handle"; one pair 8-inch combination pliers, one pair 3-inch cut tinner's shears, one soldering copper and outfit, one 5/8-inch cold chisel, one medium weight machinist's hammer, one hand maul, one hack saw and blades, flat, half round and rat-tail files; one breast drill, assorted twist drills; one prick punch, one gasoline paint burner (to heat soldering iron), one bicycle wrench, emery cloth.

In addition to the machinist tools just enumerated there should be on every cruiser certain carpenter's tools which will be found very useful. This list will give about the proper outfit:

One carpenter's hammer, one ratchet bit brace, one set auger bits, one bench axe, one ½-inch chisel, one ½-inch gouge, one hollow handle tool set, one putty knife, one nail set, one steel scraper (cabinet), one 18-inch hand saw, one sheath knife, one smooth plane, steel wool, sand paper, etc.; one 2-foot rule.

Spare packing, steel and copper wire, asbestos paper, sheet metal, wire gauze, etc., will often in emergencies prove themselves worth their weight in gold and it pays to carry an assortment of such odds and ends, for you never can tell in advance what materials you may have need of.

Carry a supply of nails, tacks and screws in wide mouthed glass bottles. You can see at a glance just which bottle to choose for the work in hand.

Carry a bottle of orange shellac for gasoline leaks. I have cured stubborn leaks in gasoline piping while under way by tightly winding the leaky joint with cotton twine saturated in shellac. It is better, however, to have all joints in the gasoline line soldered in the first place. You cannot rely on permanently tight joints when made up in any other way. If you have strainers and traps on the line and are careful to filter the gasoline you use through chamois the piping will not have to be taken apart.

Get a lubricating oil that you know can be depended upon. In general a light colored oil will deposit less carbon in the cylinder than a darker oil, and consequently is to be preferred. Carry a sufficient supply of your favorite brand to last throughout the cruise and be independent of the grewsome homemade stuff offered at some of the gasoline stations.

Tank up before starting to your full gasoline capacity and get your tanks filled at each station you come to, lest you may some time find a scarcity of fuel and run short when no supply depot is at hand. Do not allow the dealer to pump the gasoline directly into your tanks. Insist on its being run through your own funnel with its chamois and gauze filter. It is a good idea to keep a 5-gallon can always in reserve to prevent being caught with empty tanks while far from a harbor. Keep this can in a cockpit locker and securely lashed right side up.

Make it a point every night after the day's run to clean every part of the engine thoroughly, remove all surplus oil, polish the finished work and be sure that the machine is in good condition for the next day's work. Not only is this advisable to keep the boat in habitable condition but in going over every part carefully any cracks or weaknesses are apparent and may be remedied while at anchor, instead of having the parts possibly give way altogether while the boat is laboring a seaway.

Look to your bilge pump before leaving port on your cruise. Be sure that the leathers are in good shape and likely to remain so. A power pump on the engine shaft is a good thing and requires scarcely any attention. You can now get a good one ready made at reasonable cost instead of paying, as I once did, about $30.00 for the rig. That included drawings, patterns, foundry and machine work. The pump was a good one though and I never regretted that I had it made. Today, however, you can buy as good a pump for half the amount of money. My pump discharged through the same outlet that cared for the circulating water, thus saving an additional hole through the skin of the boat.

Even if you have a power bilge pump you should also have a hand pump as well, for use when it is undesirable or impossible to run the motor.

The intakes of these pumps should of course run to the lowest point in the boat and the inlet should be protected by wire gauze. They should never be arranged to pump through the water jackets of the engine.

Go over the ground tackle carefully, making sure that the manila rope lines are sound and that the whole outfit is to be depended upon. If you have no storm anchor it will pay you to add one to your equipment. Have this as large as your crew can handle and carry a long, heavy manila cable for it. This emergency anchor and line may be stowed in a cockpit locker or in the lazarette, but a regular anchor should be always kept lashed on deck with cable bent and clear for running.

The running lights should be cleaned, trimmed and filled before starting. Brass lights with fresnal glasses are the best. Do not be afraid to get lights that are a little too large for your boat. Remember that on a small motor cruiser the lights are low down and the side lights do not have the spread that they do on a larger vessel, hence they are not as easily seen. These lights are quite as valuable for your own protection as for that of the craft you meet.

Be scrupulous about setting your lights at sundown for in case of collision it would count in your favor should you be called into court, even though it was not absolutely dark at the time of the accident. Carry a substantial can for kerosene and keep it perfectly clean else the odor will be objectionable. It should be someone's work to every morning trim and fill the lamps and put them away in their locker ready for use.

If your compass has never been adjusted, better have it attended to before leaving home. Otherwise, no matter how good the instrument, it will never be dependable. Be sure that the binnacle lamp will not fail you. Electricity is best for this purpose. The compass may have a four or five-inch card and should be a liquid compass of some standard make. Have it on the center line of the boat and directly in front of the steering wheel.

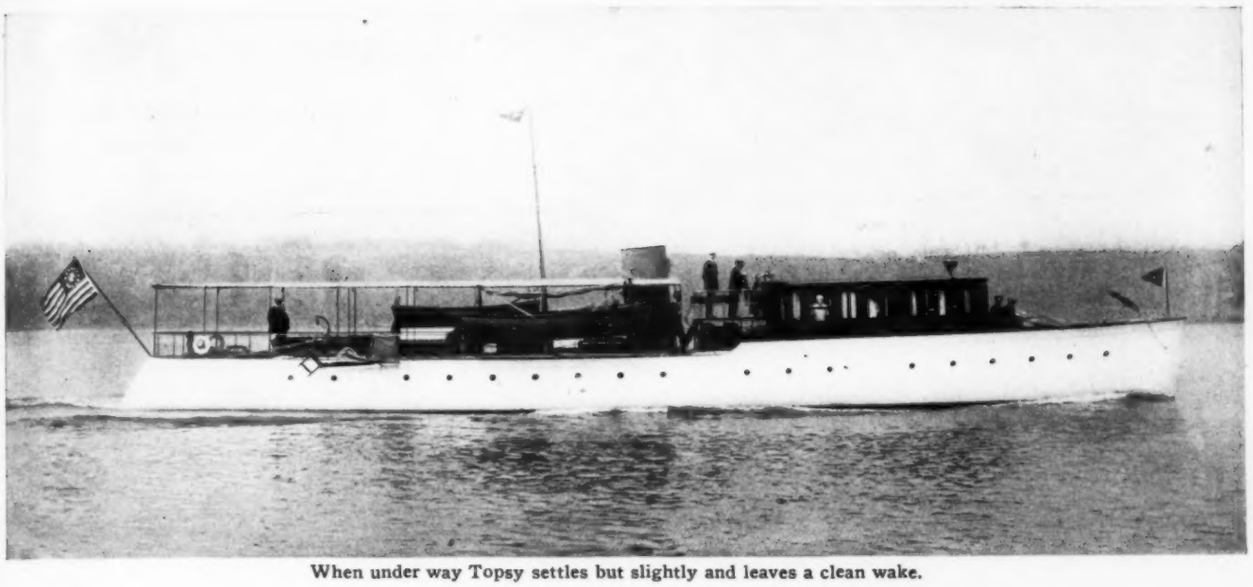
Carry charts of the entire region you are to visit. These may be rolled up and kept in a copper case when not in use. Never be afraid to consult the chart when your memory is hazy on some point. It may save trouble and your guests will think none the less of your skill.

Carry a hand lead and line, the latter properly marked according to sea practice. A pair of binoculars are most useful in picking up buoys and reading vessels' names at a distance, but of course are not indispensable.

A good chemical fire extinguisher should adorn the wall of the engine compartment. Water is wasted upon a gasoline blaze.

Carry a bow and stern line so that they will be ready at hand when making landings. These should be about forty feet in length and about ¾ inch in diameter. In case of making a rescue and being obliged to do heavy outside towing use one of your anchor cables. Carry small line for lashings and the odd purposes which are constantly arising on board ship. Carry several fenders for use when

(Continued on page 50.)



When under way Topsy settles but slightly and leaves a clean wake.

Topsy--A Twin-Screw 98-Footer.

TOPSY has recently arrived in New York waters, having run her builder's trials in Boston, and on her way around the Cape she came through a very heavy North East blow, giving her every opportunity to prove her seaworthy qualities, which she did greatly to her credit.

Designed by Messrs. Cox & Stevens, of New York, Topsy was built at the Lawly Yards of South Boston. She is 98 feet over all with a beam of 14 feet and draft of 4 feet. She is intended for high speed ferry work and also for cruising, and her estimated speed of 15 miles an hour has been verified. She is of the flush deck type throughout with the exception of a small trunk over the after quarters for their better lighting and ventilation, and has a large deck house forward containing dining room and galley. The outside of the house as well as the skylight, trunk, hatch, rail and other bright work are of teak. In the construction of the hull the double plank system was employed, and the frames, keel, etc., are of oak.

The finish in the dining room is entirely of Flemish oak and that in the quarters below, together with the furniture, chair rail, etc., is of the same material combined with white enamel paneling. The overhead portions of these quarters are also finished in white, giving a Colonial effect to the whole.

The after quarters consist of two double state-rooms, the full width of the vessel, one single state-room and a large tiled bathroom. These rooms are all ample in size and are comfortably fitted up. The forward quarters for the owner consist of one double state-room, the full width of the boat, with another tiled bathroom adjoining. This state-room communicates directly with the dining room above.

The power plant consists of two 100 horsepower Standard engines installed amidships in a compartment separated from the rest of the vessel by two steel bulkheads. This compartment also contains the gasoline tanks, which have a total capacity of 1,500 gallons, and is so large that accommodations have been provided in it for the engineer and oiler who have their own washing and toilet facilities. The captain has his own state-room forward provided with every possible convenience and there is also a separate state-room for the steward. The forecastle is comfortably arranged for the deck hands and there is accommodation in the mess room for the mess boy. This subdivision of the crew's space is a very desirable feature, from the standpoint of the operating force, and there should be no difficulty in obtaining desirable men to handle the vessel.

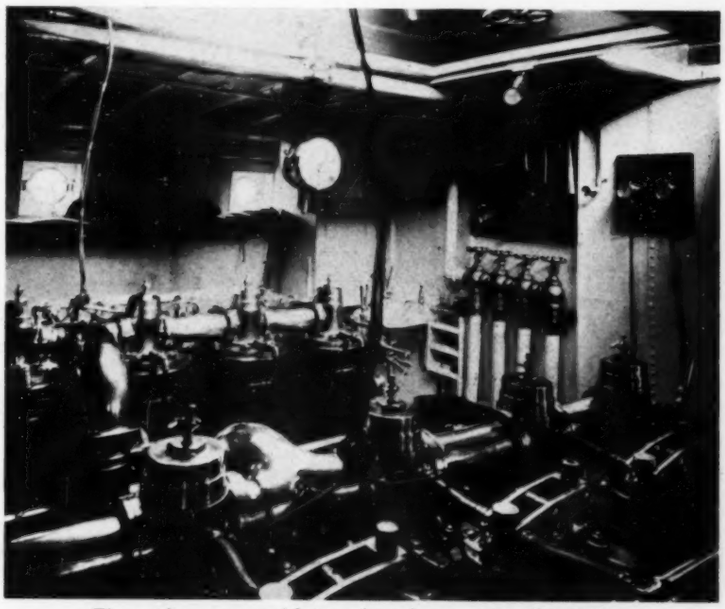
After her arrival in New York, Topsy was run over a standard mile on the Hudson, and while the present propellers were not entirely satisfactory, a speed of better than 16 miles an hour was obtained. The designers are confident that with improved wheels they will secure from one-half to three-quarters of a knot additional speed. A remarkable feature of this boat is the noticeable absence of vibration. Even while the engines are running wide open, it is almost impossible to feel any vibration at all in any part of the boat. The exhausts being in the stack provide an excellent draught in the engine room and the noise of the exhaust is but slight, being noticeable only on the bridge.

The illustrations show the unusual amount of clear deck which is the principal advantage that the flushed deck boat has over the trunk cabin type. With the large number of air ports and the ample skylights provided, there should be no difficulty in obtaining plenty of light and ventilation.

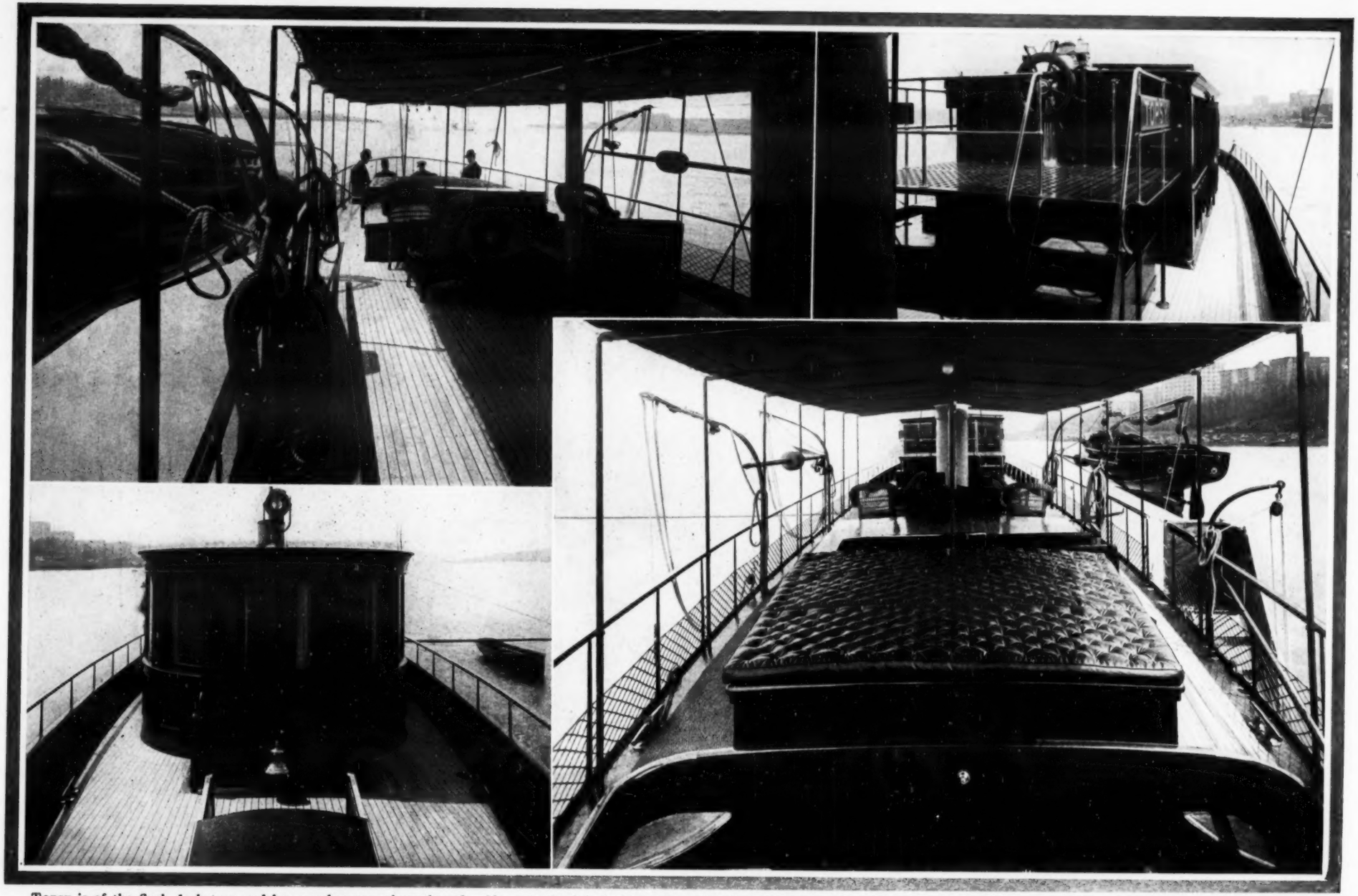
Owing to her liberal beam and the fact that most of her weights are low, she is not at all a heavy roller and her good freeboard, flaring sections forward and the fact that her heavy weights are amidships, make it possible for the boat to be driven hard in heavy weather without discomfort to those on board. Her maneuvering qualities are excellent, as it is possible, by going ahead on one engine and astern on the other, to turn quickly without any forward motion at all, and her regular turning circle with both engines going ahead is quite small. The machinery has been found most satisfactory, the engines running with absolute regularity, and when once set for a certain number of revolutions, they will continue to run at this speed without variation.

When under way Topsy settles so slightly that it is not noticeable; she leaves a very clean wake and picks up her speed very quickly. Her lines are clean and harmonious and there is a striking simplicity about her equipment above decks. A short, broad stack amidships lends to her appearance and just aft of this is stepped a signal mast. An awning stretched from the bridge deck to the stern protects the entire after deck

Topsy is owned by Mr. John C. King, of New York, and with her roomy quarters and stowage space, ample head room and excellent appointments throughout, she should prove a most satisfactory all-'round cruiser.



The engine room and brace of 100 horse power Standards.



Topsy is of the flush deck type and has ample space above board. Above to the left, looking along the after deck from the stack; to the right, the bridge deck and house from the same point. Below on left, the deck house and crew's hatch, seen from the bow; On right, looking forward from the cockpit.

The interior of the dining room on the left is finished entirely in Flemish oak while that below decks is of the same wood with white enamel paneling, as shown by the interior of one of the double staterooms on the right.

Talks With Our Naval Architects.

H. Newton Whittelsey.

H. NEWTON WHITTELSEY received his education in this country at the University of Minnesota, and then went abroad in 1897 for a post graduate course in Naval Architecture at the University of Glasgow. After returning to this country he was employed as steel worker at the plant of the Bath Iron Works, at Bath, Maine, and then went with the Gas Engine and Power Company and Charles L. Seabury, Consolidated, of Morris Heights, New York City, where he worked for two years under Mr. Seabury and had charge of the drawings upon one torpedo boat and one destroyer for the Government. At the plant of the Maryland Steel Company, at Sparrows Point, Maryland, he later had charge of the drawings for the torpedo boat destroyers Truxton, Whipple and Worden.

After spending two years with the New York Shipbuilding Company, of Camden, N. J., Mr. Whittelsey was employed by a yacht building plant on Staten Island where he designed and took out a patent upon the hull construction of the well known 60-foot motor boat Standard, and then went with the Williams-Whittelsey Company, of Long Island City, where he designed a number of boats.

The work that has particularly characterized Mr. Whittelsey and which is especially distinctive, is the bringing out and developing of the modern type of large raised deck cruiser. The first of this type to be built was Raduga, which is shown below and which belonged to the fleet of the Brooklyn Yacht Club. To Mr. Whittelsey belongs the credit of first designing a practical type of raised deck cruiser of large size, and the Dolph, 57 feet in length, closely followed the building of Raduga.

Mr. Whittelsey is a great believer in the heavy, solid cruiser of good freeboard equipped with a medium power, long stroke engine of a heavy type. He has endeavored to design hulls for the best possible speed in rough water and maintains that the U section forward form of hull is best. A noticeable feature of his designs is the strong flare, deep middle body with a large deadrise and a medium fine afterbody for the sea-going type.

H. Newton Whittelsey.

"The keel," said Mr. Whittelsey, in discussing constructional detail, "should be designed so that the deadwood extends well aft in order that there may be a straight docking line upon which to haul out. An especially deep midship section is desirable and very important so that maximum strength may be obtained and particular care should be given in the design to obviate any quick breaks in the main shear."

Mr. Whittelsey is a strong believer in water-tight and stiffening bulkheads and uses from three to four such in all his later boats. He also believes in extra heavy interior longitudinals. A feature of his construction has been the installation of the engine which is landed on heavy side keelsons running two-thirds the length of the boat. By the use of this method in connection with solid interior construction, he has succeeded in substantially stopping all material vibration. For boats required to do service in heavy water, he believes in ballast and all his raised deck cruisers have been so fitted either inside or out.

Mr. Whittelsey has given his chief attention in later years to the production of cruisers of the larger type. "Long distance cruising races," said he, "while perhaps not attracting a large number of individual entries, have proved of inestimable value in bettering hull construction. I am a firm believer in heavy construction and long distance races have shown to the public the advantages of heavy and solid hulls for all kinds of service. It is the same principle that has been brought out in automobile construction. Everyone does not want a 90 horsepower racing car, but the building of such cars has had a material effect upon the manufacture of strong and substantial machines for general uses. In the same way the seaworthy ability of the deep sea cruiser is copied and followed out to a considerable extent, and this is known to have had a good influence upon the general design of craft of all kinds.

Raduga, constructed after one of Mr. Whittelsey's best known designs, was the first large cruiser of the popular raised deck type.

Navigation for the Motor Boatman.

The Principles, Which if Mastered, Infinitely Increase the Possibilities of Motor Boating. For the Motor Boatman Who Is Not Content to Hug the Shore.

PART III.

By Capt. B. D. Reese.

Correcting Courses

WHEN a vessel has been steered on a course by her compass, it is very rarely that she makes progress in the actual direction indicated. The winds and currents affect the vessel, and the compass has defects that will have to be allowed for, before the course steered will be of much value in ascertaining her position.

When the wind is on her side, if it is anyway strong, it will drive a vessel more or less sideways, or to leeward. This is called the "leeway." The amount of leeway has to be estimated by the navigator on the spot. It is defined as "The angle between the line of a vessel's keel and her wake."

The effect of a current or tide is usually allowed for as an independent course.

The errors of the compass are variation and deviation.

Variation is defined as the angle between the true and magnetic meridians. The true meridian means the exact direction of the North or South Pole. The magnetic meridian means the direction in which a compass needle points at the particular locality. Its amount and direction are always given on the chart.

If the north end of the compass needle points to the right, or eastward of the meridian, it is called easterly variation; if to the left or westward, it is called westerly.

Deviation is defined as the angle between the magnetic meridian and the direction of the ship's compass needle. It is caused by the iron in the ship; whether it is contained in her construction, equipment, or cargo. It is termed easterly, when the north point of the ship's compass needle is drawn to the right of the magnetic meridian; and westerly, when it is drawn to the left.

The leeway and the courses are usually given in points; the variation and deviation in degrees. When correcting courses, the leeway is most easily applied in points; then convert the course into degrees and correct it for variation and deviation. There should always be a table of the quarter-points of the compass and their equivalents in degrees and minutes handy when correcting courses.

Rule: Allow leeway:

When on the PORT TACK.....to the RIGHT
" STARBOARD TACK.....to the LEFT
Allow Variation or Deviation—
EASTERLY.....to the RIGHT
WESTERLY.....to the LEFT

If you hold the compass card with the north point from you, you will observe that the N.E. quadrant is to the right, and the N.W. quadrant is to the left. If you now turn the card, and hold it south end from you, you will have the S.W. quadrant to the right and the S.E. quadrant to the left.

For convenience in correcting courses an arbitrary rule has been adopted; everything to the right is marked +, and everything to the left is marked —. The rule for using these signs is: Add all like signs, and subtract all unlike signs. Remember that:

N.E. and S.W. quadrants are marked + (plus)
N.W. and S.E. quadrants are marked — (minus)
Leeway on Port Tack is marked +
Leeway on Starboard Tack is marked —
Easterly Variation or Deviation +
Westerly Variation or Deviation —

A ship is on the starboard tack when she has the wind on the starboard side, and on the port tack when she has the wind on the port side.

Correct the following courses:

No.	Compass Courses	Winds	Leeway	Variation	Deviation
1.	N.E. by E.	E.S.E.	2 pts.	12° W.	8° E.
2.	N.E. by E.	N. by W.	2 "	12° E.	8° W.
3.	N. by W.	N.E.	½ "	5° E.	17° W.
4.	E.N.E.	North	1¾ "	15° E.	5° E.

1. Compass Course N. 5 pts. E. +
Leeway..... 2 " — (starboard tack)

Making good... N. 3 pts. E. = N. 33° 45′ E. +
Variation ..... 12° 00′ W. —

Correct Magnetic..... N. 21° 45′ E. +
Deviation ..... 8° 00′ E. +

True Course..... N. 29° 45′ E.

2. Compass Course N. 5 pts. E. +
Leeway..... 2 " + (port tack)

Making good... N. 3 pts. E. + = N. 78° 45′ E. +
Variation ..... 12° 00′ E. +

Correct Magnetic..... N. 90° 45′ E. +
Deviation ..... 8° 00′ W. —

True Course..... N. 82° 45′ E.

3. Compass Course N. 1 pt. W. —
Leeway..... ½ " — (starboard tack)

Making good.. N. 1¼ pts. W. = N. 16° 53′ W. —
Variation ..... 5° 00′ E. +

Correct Magnetic..... N. 11° 53′ W. —
Deviation ..... 17° 00′ W. —

True Course..... N. 28° 53′ W

4. Compass Course N. 6 pts. E. +
Leeway..... 1¾ " +

Making good.. N. 7¾ pts. E. + = N. 87° 11′ E. +
Variation ..... 15° 00′ E. +

Correct Magnetic..... N. 102° 11′ E. +
Deviation ..... 5° 00′ E. +

True Course..... N. 107° 11′ E.
Subtract from..... 180° 00′

True Course..... S. 72° 49′ E.

When the corrected course becomes greater than 90°, it must be subtracted from 180°, and the north or south sign changed; as there are only 90° in each quadrant.

Correct the following courses:

No.	Compass Courses	Winds	Leeway	Variation	Deviation
1.	N.N.E.	N.W.	1½ pts.	9° W.	4° W.
2.	N.N.E.	E.N.E.	1½ "	9° E.	4° E.
3.	S.S.W.	W.S.W	¾ "	11° W.	7° E.
4.	S.S.E.	S.W.	2 "	6° E.	10° W.
5.	W.S.W.	South	1 "	14° E.	6° E.
6.	S.E. by S.	E. by N.	2½ "	16° E.	4° W.
7.	E. ½ S.	S. ½ E.	1 "	7° W.	5° E.
8.	S.E. ¾ E.	S. by W.	3 "	21° W.	16° W.
9.	N. ½ W.	W. by N.	1 "	12° E.	6° W.
10.	North	W.N.W.	1½ "	11° W.	6° W.
11.	East	N.N.E.	1¼ "	7° E.	4° E.
12.	E by S. ½ S.	S. ½ E.	1½ "	10° W.	3° E.
13.	E.S.E.	South	1 "	18° W.	6° E.

If the course is east or west mark down 90° 00′ and give it the opposite sign to the error.

"Latitude in," "Longitude in."

When it is desired to mark a ship's position on the ocean, her latitude and longitude are given, and a vessel having sailed on any course and distance, is said to have sailed from one position in a certain latitude and longitude into another position in a different latitude and longitude. In calculation, the place she starts from is marked the "latitude left," and "longitude left," and the place arrived at is called the "latitude in" and "longitude in." The difference of latitude and difference of longitude applied to the latitude and longitude left will give the latitude and longitude in. Thus:

Latitude left ..... 37° 25′ N.
Difference of Latitude 236′ N. =..... 3° 56′ N.

Latitude in ..... 41° 21′ N.

Longitude left ..... 51° 38′ W.
Difference of Longitude 347′ W. =..... 5° 47′ W.

Longitude in ..... 57° 25′ W.

Had the difference of latitude in the above case been marked S. or had the difference of longitude been marked E. it is evident that in either case the quantity would have been to subtract.

Find the latitude in, in the following cases:

	Lat. left	Diff. Lat.	Long. left	Diff. Long.
1.	35° 28′ N.	193′ N.	71° 23′ W.	217′ W.
2.	43° 18′ S.	229′ N.	67° 46′ W.	234′ E.
3.	51° 44′ N.	345′ S.	33° 33′ E.	153′ W.
4.	7° 23′ S.	528′ N.	178° 42′ W.	321′ W.
5.	0° 11′ N.	156′ S.	169° 35′ E.	846′ E.
6.	22° 44′ S.	71′ S.	4° 13′ W.	357′ E.

The Traverse Table.

The Traverse Table (Table 2, Bowditch) contains the difference of latitude and departure for every course from 1° to 89° and the distance up to 600 miles. Departure, is the actual number of nautical miles sailed east or west; in distinction from the minutes of longitude, which constantly vary with the latitude. The courses run from 1° to 45° on the top of the page, and from 45° to 89° at the bottom. The distances run in columns of 60 miles each.

If you will open the table at 1° and look up any number in the distance column you will see that the first column under Lat. is very large, compared with the number in the column under Dep. Say you look up 25 miles, then turn through the table looking up the 25 on each page; you will notice that the number in the Lat. column is getting steadily smaller, while the number in the Dep. column is getting larger, until at 45° they are equal. When the course is found at the bottom the numbers change their names, Lat. at the top becoming Dep. at the bottom, and Dep. at the top becoming Lat. at the bottom of the page.

The difference of longitude and departure corresponding to each other in any latitude may be found in the Traverse Table thus:

Find the given degree of latitude at the top or bottom of the page, look for the minutes of longitude in the distance column, and you will find the corresponding departure in the latitude column. Should you wish to find the actual length of a degree of longitude in any latitude, proceed as directed above and use 60′ in the distance column.

When it is desired to find the difference of longitude made by a vessel when she has sailed in any other direction than true east or west, the middle latitude is found; then:

Take the middle latitude as a course and the departure in latitude column, you will find the difference of longitude in distance column.

In the following questions find the middle latitude; difference of longitude and longitude in.

Example:

Lat. left.. 43° 38′ N....43° 38′ N. Departure 237′ W.
Lat. in... 37° 42′ N....37° 42′ N.

Diff. Lat. 5° 56′ 2)81° 20′
60 Mid. Lat. 40° 40′
356 miles

Taking 41° (the nearest degree) as a course, and looking for 237 in the latitude column we find 314 in the distance column.

Long. left ..... 68° 28′ W.
Diff. long. 314 = ... 5° 14′ W.

Long. in ..... 73° 42′ W.

	Lat. left	Lat. in	Departure	Long. left
1.	57° 24′ N.	36° 48′ N.	409′ E.	37° 12′ E.
2.	38° 15′ S.	47° 26′ S.	183′ W.	13° 50′ E.
3.	10° 32′ N.	9° 33′ S.	256′ E.	8° 34′ W.
4.	45° 27′ S.	12° 21′ N.	321′ W.	175° 28′ W.
5.	37° 46′ N.	25° 58′ N.	483′ E.	178° 30′ E.
6.	27° 15′ S.	39° 44′ S.	521′ W.	5° 14′ E.

Note:—Should the departure be greater than you can find in the table, divide it by 2 or 3; not forgetting to multiply the quantity taken out of the distance column by the same number.

To find the course and distance between any two places.

1. By Middle Latitude Sailing.

The latitudes and longitudes of the two places being given, find the difference of latitude, middle latitude, and difference of longitude.

Then by the preceding rule: Take the middle latitude (to the nearest degree) as a course look for the difference of longitude in the distance column and take the departure out of the latitude column.

Now having the difference of latitude and departure given, take the larger quantity, whichever it is, and look it up in the first column in any part of the table, if the quantity in the second column is greater than your smaller one, turn backwards in the table, but if it is less, turn ahead, until you find the nearest pair to those in the question, and take out the course and distance.

If the difference of latitude is the greater, course from the TOP. If the departure is the greater, course from the BOTTOM.

Find the course and distance from A to B in the following examples:

Lat. A...41° 23′ N....41° 23′ N. Long. A..67° 43′ W.
Lat. B...36° 15′ N....36° 15′ N. Long. B..62° 31′ W.

Diff..... 5° 8′ S. 2)77° 38′ Diff. ... 5° 12′ E.
60 60
Mid. Lat. 38° 49′ 312′
308 miles

Taking middle latitude 39° as course, and difference of longitude 312′ in the distance column, we find the departure 242.5 in the latitude column.

Look up difference latitude 308 in the first column until you find the nearest departure to 242.5 which is 241.3: under 38° as a course and 392 in distance column. Course is S. 38° E. 392 miles.

The course found above is the true course. To find the course to steer: Apply the variation and deviation (if any) with their signs reversed. That is, easterly *minus*, and westerly *plus*.

In the above case if the variation were 10° W. and the deviation 6° E., the error would be 4° W. Apply it + in a — quadrant, we get S. 34° E.

Find the course to steer and distance from A to B, when

1. Lat. A.... 31° 12′ N. Long. A.... 67° 34′ W.
Lat. B.... 38° 47′ N. Long. B.... 71° 22′ W.
Var. 12° E. Dev. 7° E.

2. Lat. A.... 4° 5′ N. Long. A.... 24° 38′ E.
Lat. B.... 1° 15′ S. Long. B.... 19° 25′ E.
Var. 10° W. Dev. 4° E.

3. Lat. A.... 54° 46′ S. Long. A.... 2° 36′ E.
Lat. B.... 43° 21′ S. Long. B.... 4° 5′ W.
Var. 22° W. Dev. 5° W.

4. Lat. A.... 32° 18′ N. Long. A.... 54° 37′ W.
Lat. B.... 38° 9′ N. Long. B.... 59° 38′ W.
Var. 10° W. Dev. 6° W.

5. Lat. A.... 7° 48′ S. Long. A.... 2° 2′ E.
Lat. B.... 2° 59 S. Long. B.... 4° 58′ W.
Var. 18° E. Dev. 11° W.

II. Mercator's Sailing.

The following method is preferred by some for finding the course and distance:

Find the difference latitude, meridian difference latitude and difference of longitude. Then: With the meridian difference latitude in the latitude column and the difference of longitude in the departure column, find the course. On the same page, with the difference of latitude in its proper column, take out the distance.

Example:

Lat. A..... 42° 27′ N. Mer. pts..... 2802.4
Lat. B..... 47° 11′ N. Mer. pts..... 3201.7

Diff. ..... 4° 44′ N. Mer. diff. lat.... 399.3
60 Half = 199.6
284 miles

Long. A..... 66° 25′ W.
Long B..... 75° 13′ W.

Diff. ..... 8° 48′ W.
60
528′

Half = 264

When you look in the table, you find that 528 and 399 are too large, so you take the halves to find the course, 53°. S. 53° E. Finding 284′ in its proper latitude column gives 472 miles distance.

Find the course to steer, and the distance from A to B.

1. Lat. A.... 32° 18′ N. Long. A.... 54° 37′ W.
Lat. B.... 37° 49′ N. Long. B.... 60° 38′ W.
Var. 10° W. Dev. 6° W.

2. Lat. A.... 7° 48′ S. Long. A.... 2° 2′ E.
Lat. B.... 2° 59′ N. Long. B.... 4° 58′ E.
Var. 18° E. Dev. 11° W.

3. From N.E. End L.V.....Lat. 38° 58′ N.
Long. 74° 30′ W.
To Block Island.....Lat. 41° 09′ N.
Long. 71° 33′ W. Var. 8° W. Dev. 5° W.

4. From Ambrose Channel L.V.....Lat. 40° 28′ N.
Long. 73° 50′ W.
To Five Fathom Bank L. V.....Lat. 38° 47′ N.
Long. 74° 34′ W. Var. 6° W. Dev. 6° E.

5. From 5 Fathom Bank L. V.....Lat. 38° 47′ N.
Long. 74° 34′ W.
To Montauk Point.....Lat. 41° 04′ N.
Long. 71° 51′ W. Var. 7° W. Dev. 5° W.

Answers:

I. True Courses.

1. N. 26° E. 2. N. 19° E. 3. S. 10° W. 4. S. 49° E.
5. N. 81° W. 6. S. 6° W. 7. N. 82° E. 8. N. 56° E.
9. N. 12° E. 10. North. 11. S. 65° E. 12. N. 83° E.
13. N. 89° E.

II. Latitude and Longitude in.

	Lat. in	Long. in		Lat. in	Long. in
1.	38° 41′ N.	75° 00′ W.	4.	1° 25′ N.	175° 57′ W.
2.	39° 29′ S.	63° 52′ W.	5.	1° 25′ S.	176° 19′ W.
3.	45° 59′ N.	31° 00′ E.			

III. Difference of Longitude and Longitude in.

	Mid. Lat.	Diff. Long.	Long. in
1.	47° 6′	600′ E.	47° 12′ E.
2.	42° 50′	250′ W.	11° 40′ E.
3.	0° 29′	256′ E.	4° 18′ W.
4.	16° 33′	336′ W.	178° 56′ E.
5.	31° 52′	569′ E.	173° 1′ W.
6.	33° 29′	622′ W.	5° 8′ W.

IV. Middle Latitude Sailing.

	Diff. Lat.	Mid. Lat.	Diff. Long.	Dep.	True Course	Course to Steer	Distance
1.	455′ N.	34° 59′	228′ W.	186.8′	N. 22° W.	N. 41° W.	491 miles
2.	320′ S.	1° 55′	313′ W.	312.8′	S. 44° W.	S. 50° W.	445 "
3.	685′ S.	49° 3′	401′ W.	263.1′	S. 21° W.	S. 48° W.	734 "
4.	351′ N.	35° 13′	301′ W.	246.6′	N. 35° W.	N. 19° W.	429 "
5.	289′ N.	2° 24′	420′ W.	419.8′	N. 56° W.	N. 63° W.	506 "

V. Mercator's Sailing.

	Diff. Lat.	Merid. Diff. Lat.	Diff Long.		True Course	Course to Steer	Distance
1.	331′ N.	402.9	361′	.....	N. 42° W.	N. 26° W.	445 miles
2.	647′ N.	644.2	176′	.....	N. 15° E.	N. 8° E.	670 "
3.	131′ N.	170.5	177′	.....	N. 46° E.	N. 59° E.	189 "
4.	101′ S.	130.6	44′	.....	S. 19° W.	S. 19° W.	107 "
5.	137′ N.	177.9	163′	.....	N. 43° E.	N. 55° E.	187 "

A Brief Explanation of the Action of the Storage Battery When Charging and Discharging.

By C. Peterson.

CONTRARY to general impression, no storage battery stores electrical energy. The charging current does, however, through a chemical action, place the active material of the plates in opposition, after which, if an external circuit be cut in, the apparatus is capable of giving off current by means of this reversed chemical action.

It will be remembered that both plates were originally identical in makeup and the only reason why they do not assume this original condition is that we do not permit a discharge below 1.7-1.8 volt per cell on account of the insoluble, insulating sulphate formed below this value.

It is essential that the charging current be direct, since no chemical action can be induced by alternating current; constant, since the full charge will be about .05 volt per cell less for each 20% decrease from the normal charging rate. The current must flow from the positive to the negative plate and the charging should be carried to completion without break.

There are three indications of a complete charge. The positive plate assumes a rich dark brown color and the negative a light gray. The gassing of the electrolyte increases. The voltage reaches a maximum value between 2.4-2.7 volts per cell.

It might be well to mention the fact that all battery readings must be taken while the current is flowing in order to be of any value. Readings taken on open circuit are misleading and cause about 90% of the trouble hunting.

At the completion of the charge the acid should test between 1.20-1.24 on an ordinary hydrometer. If below this value, it should be brought up by adding acid. This condition is hardly probable unless the battery has been repeatedly carried beyond the full charge point, in which case the acid would be lost by excessive spraying.

In such small installations acid replenishing is really needed only about once a year. Under ordinary conditions, any loss in the electrolyte is caused by evaporation and may be replaced by adding distilled water, to bring the liquid to the proper height.

When you want acid, don't go to a drug store and just ask for sulphuric acid, if you do, you will doubtless get an acid made of pyrites, which will generally contain matter ruinous to batteries.

Get the concentrated acid, made of sulphur or brimstone. To be on the safe side, buy a pound bottle, in this case you get an original package.

When it comes to mixing the acid, don't pour the water in the acid. The rapid formation of heat is liable to throw the mixture out of the container and anything the liquid touches it burns badly. Pour the acid into the water slowly. The proportions must be 1 to 5 by volume.

The best testing outfit consists of a syringe having the hydrometer inside the glass tube.

Where the charging current is taken from the street service a resistance must be used in order to control the charging rate. This resistance should be adjustable in order that part of it may be cut out as the voltage of the cells increase. It may be either a wire rheostat or a bank of lamps. In the latter case a 32 C.P. 110 volt carbon lamp has about 110 ohms resistance and will carry about 1 ampere. If five of these lamps be connected in parallel the charging current may be limited to 5 amperes or the normal charging rate of the battery.

Before connecting the battery to the wire leads, determine the positive side of the circuit either by means of a polarity indicator or by the water method, viz.:

Hold the free ends of the wire in a glass of water, preferably acidulated, the bubbles are coming off the negative wire.

As the lake is frequently choppy the boats were given considerable flare and an extreme turtle deck.

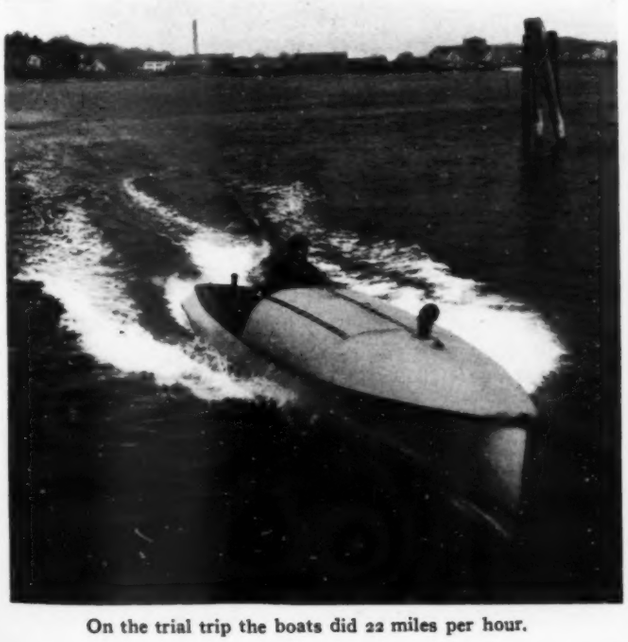
A New Class of "One Designers".

The Latest Development in the Growing Movement to Increase Interest in Motor Boat Racing. Five Speedy Thirty-Footers of Forty Horse Power, for Use On Lake Placid.

AS a result of the dissatisfaction with handicap races between boats of all sorts, sizes and powers, there is a growing tendency among many of the clubs toward the one design classes. To race a 75 horsepower boat against a 3-horse dory, is not the acme of sport and usually at the end of the race there is only one less kick over the result than there were boats entered in the race. The clubs are beginning to see that one design racing will eliminate much of the former difficulty, as at the start the man who knew the most about his boat would have the advantage, the first boat to finish would be the winner and neither the owner nor the spectators would be in doubt as to the fact, and there would be a premium upon knowledge and care of the engine. Furthermore, if manufacturers were limited to a certain piston area for the various classes, there would be an incentive to go much deeper into the science of engine building.

The accompanying photographs are of one of the five new one design boats, built by the Holmes Motor Company, at West Mystic, Connecticut, for several of the summer residents of Lake Placid, where it is already planned to hold several long distance races during the following summer, besides the regular weekly races to decide the championship.

These boats have a framework of oak and are planked with selected white cedar. The trimmings and interior finish throughout being in mahogany. It will be seen that the forward part of the boat is protected by an extreme turtle deck, very strongly constructed and under which the engine is installed. The engine controls and the steering wheel are brought to the bulkhead at the after part of this compartment, at which point the gasoline tank is also located. The cockpit is very large and will seat ten people comfortably.



On the trial trip the boats did 22 miles per hour.

The over all length of the boat is 30 feet; the beam is 4 feet 10 inches and the draft at propeller is 2 feet. There is considerable flare forward, as choppy seas are common on this lake, and this, together with the high crown turtle deck and liberal freeboard have produced an exceptionally dry boat. The planking is 5/8 of an inch thick and the ribs are placed very close together for greater strength.

The power equipment of these boats is the model C, 6-cylinder, 35-40 horsepower Holmes automobile engine of 4 5/16-inch bore and stroke of 6¼ inches. The weight of the engine complete is about 800 pounds and the normal speed is 900 r.p.m. Two advantages particularly claimed for this engine are its long stroke and its accessibility.

The new boats are exceptionally dry.

To the former is attributed the ability to slow the engine down to a very low speed, without stalling when the clutch is thrown in, and also the general flexibility of the motor. It is possible to remove any part of this motor in a very short time without lifting off the cylinders, which quality will appeal greatly to the man who cares for his own boat.

Lubrication is by forced feed to all bearings and is controlled directly from the bulkhead. The ignition system consists of a Bosch low tension magneto, magnetic plugs, and a small single coil with battery for starting on the switch.

At the first trial trips of these boats, which were held some four weeks ago, ease of handling and dryness were very noticeable features and the speed attained was two miles in excess of that specified, as an actual speed of 22 miles per hour was obtained. The lines of these boats will be found in the Department of New Motor Boat Designs in this issue.

There have been a number of one design classes produced throughout the country lately, and it is to be hoped that the movement will continue for there is no doubt that it will not only produce better boats and engines, but will greatly stimulate interest in motor boat racing.

New Motor Boat Designs.

Eph, A Twin-Screw Cruiser.

THE plans below are of a 75-foot twin-screw cruiser, designed and now nearly completed at the plant of the Truscott Boat Mfg. Co., of St. Joseph, Mich., for Mr. Carl G. Fisher, of Indianapolis, Ind.

The principal dimensions of the boat are as follows: Length over all, 75 feet; waterline length, 67 feet 4 inches; beam, 13 feet; draft, 4 feet; and least freeboard, 4 feet. It is of the raised deck type with a combination pilot house and dining saloon forward and the trunk cabin extending aft.

The power plant consists of two six-cylinder, 55 h.p. Truscott 4-cycle motors, installed just forward of amidships, the motor room being separated by steel bulkheads from the rest of the boat. The ceiling is also sheathed in steel, making it absolutely fireproof. In this compartment is also installed a direct-connected electric lighting set. The fuel is carried beneath the after deck, and the capacity of the tanks is about 400 gallons.

The main saloon is located directly aft of the motor room and is provided with wide locker seats above which are lockers and alcoves. A buffet with leaded glass doors is built into the starboard side and on the port side is a writing desk and bookcase also built-in. There is a fireplace at the after end and a folding table in the middle. From the forward end a flight of steps lead to the dining saloon and pilot house, just above the motor room, and leading aft on the port side is the passageway to the after companionway. To starboard of this passageway there is a state-room connecting with a toilet room just aft of it and aft of this there is another large state-room extending the full width of the boat and also connecting with the toilet room.

Forward of the motor room is the galley which extends the full width of the boat and includes the usual fixtures, including a large range and a refrigerator of exceptionally large capacity. This room is connected with the dining saloon above by a curved staircase. The crew's quarters, including two berths and toilet, are in the forward part of the boat.

There is ample deck space, as will be seen by a glance at the plans, and the boat may be steered from either the bridge deck or from the pilot house.

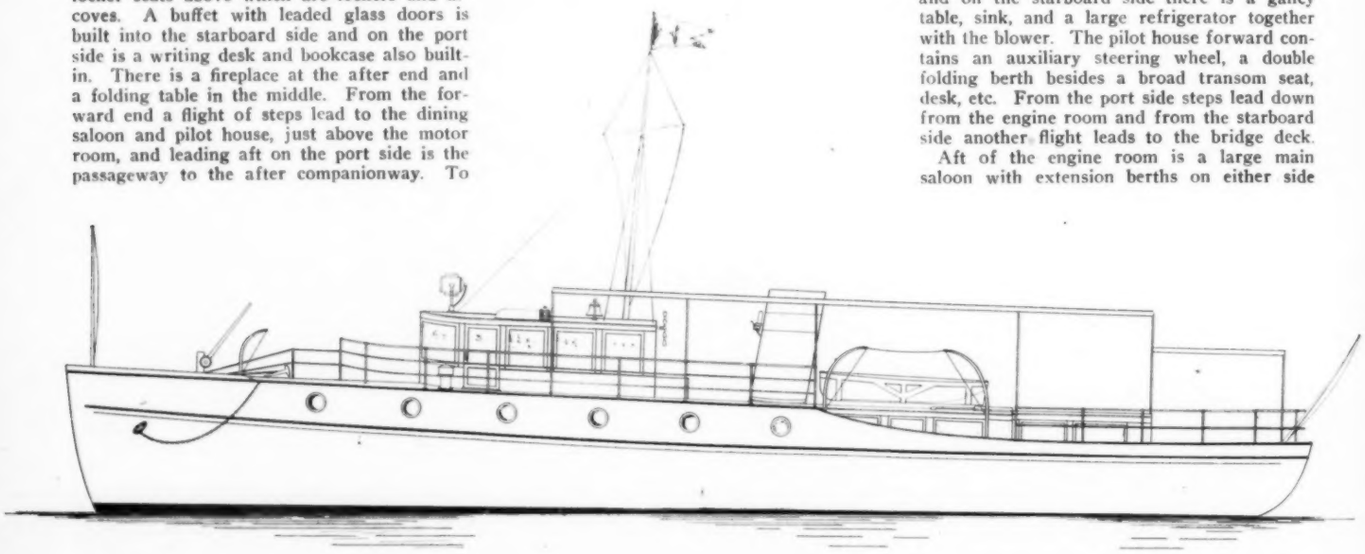
The frames, keel and deadwood are all of white oak and the planking is of clear red cypress. The pilot house and the cabin interior aft of the motor room and all exterior finish are in solid mahogany. The boat is well proportioned with liberal draft and freeboard and with her well laid out interior should make an ideal cruiser.

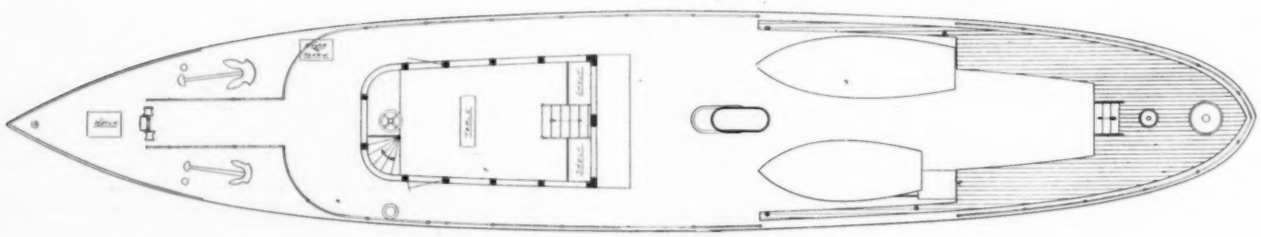
55-Foot Bridge Deck Cruiser.

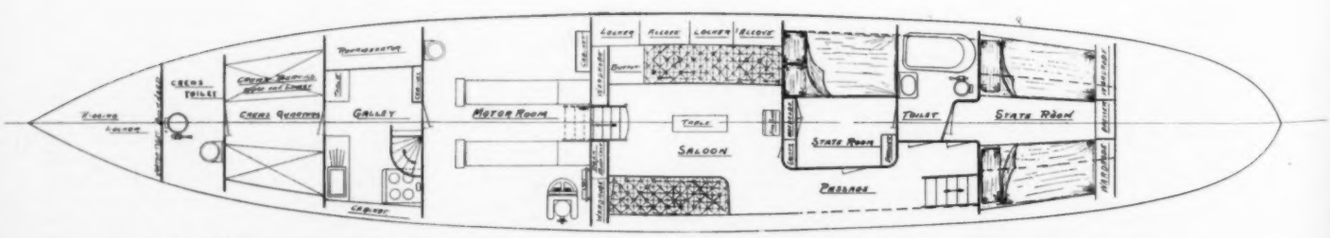
THE design on the opposite page is of a 55-foot cruiser nearing completion at the Matthews Boat Co., Port Clinton, O. The boat is for Mr. Arthur Duvic, of New Orleans, and is to be used on the Mississippi River and Gulf. The accommodations are therefore adapted for hot weather service. With this in view the bridge deck was made exceptionally large. It is situated amidships and is high and well protected from the sun by a large awning extending somewhat beyond it both fore and aft. The interior was kept well open and undivided into smaller compartments and the windows are arranged to drop into pockets. These features together with a forced draft system installed in the engine room will insure a comfortable boat in the hottest weather.

The motor is a 40 h.p., 4-cylinder Murray & Tregurtha and this is installed amidships in an ample engine room beneath the bridge deck, which compartment also contains the galley. The stove is placed on the port side together with a folding berth for a paid hand and on the starboard side there is a galley table, sink, and a large refrigerator together with the blower. The pilot house forward contains an auxiliary steering wheel, a double folding berth besides a broad transom seat, desk, etc. From the port side steps lead down from the engine room and from the starboard side another flight leads to the bridge deck.

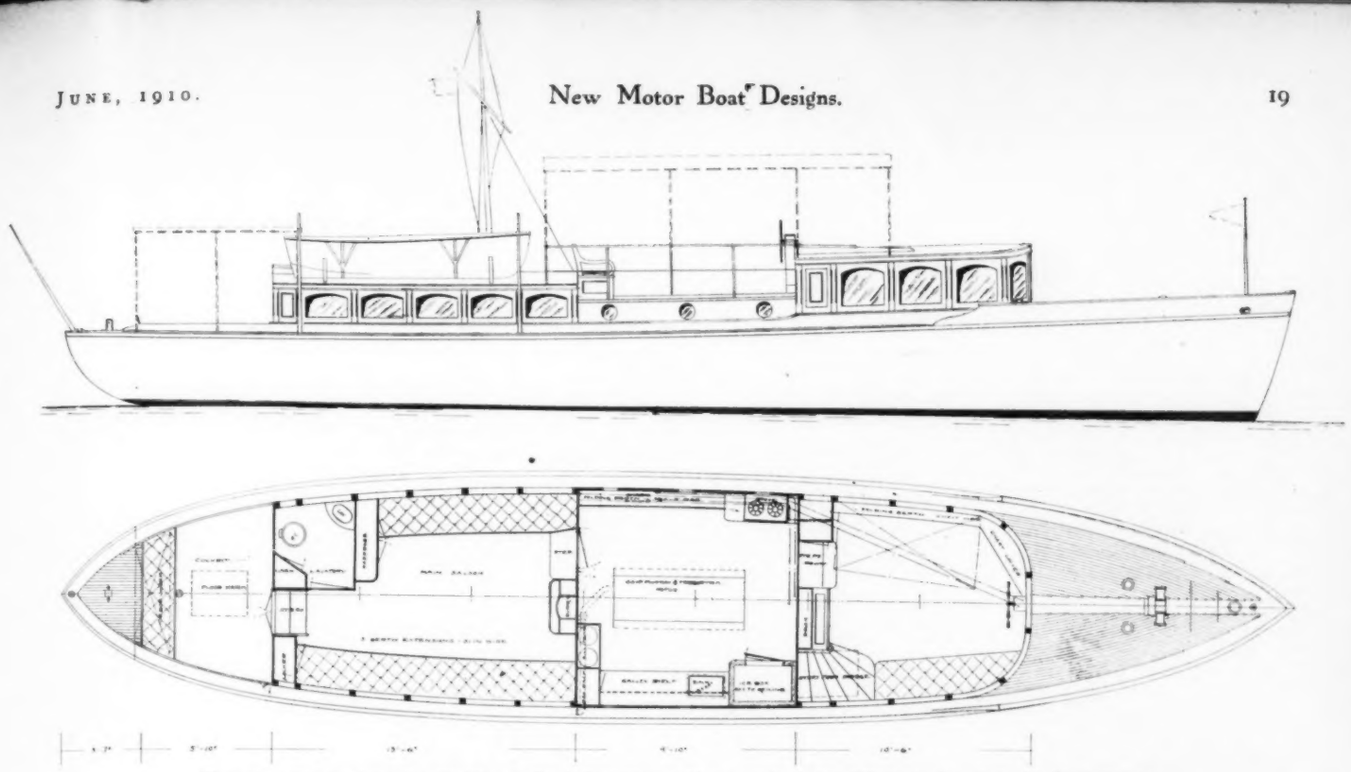
Aft of the engine room is a large main saloon with extension berths on either side







The Truscott twin-screw 75-footer is trim in appearance and has all the qualities that make for seaworthiness.



The 55-footer built by the Matthews Boat Company will be used on the Mississippi and the Gulf of Mexico.

accommodating three people. There is a buffet on the forward bulkhead to port of which steps lead down to the engine room. From the after end a companionway leads to the cockpit and to port of this is the lavatory containing linen locker, etc.

The gasoline tanks are under the forward deck. The bridge deck is provided with a steering wheel at the forward end, so arranged as to work independently of the wheel in the pilot house. There is ample room for chairs and across the after end is a permanent divan seat with locker under. Weather protection is secured by brass pipe-frame awnings fitted with side curtains, the top being covered with khaki duck. There is a military mast aft over the main saloon. The windows in the cabin drop into pockets and are provided with copper screens. The ventilation in the motor room is provided for by cowls, forced draft, and hinged brass port lights.

The keel and frames are of oak and the planking is of cedar, copper riveted throughout. The decks are of white pine and the finish and superstructure are of mahogany. The boat will carry a power dinghy and will maintain an average speed of about 12 miles per hour.

Bettina, A 61-Footer.

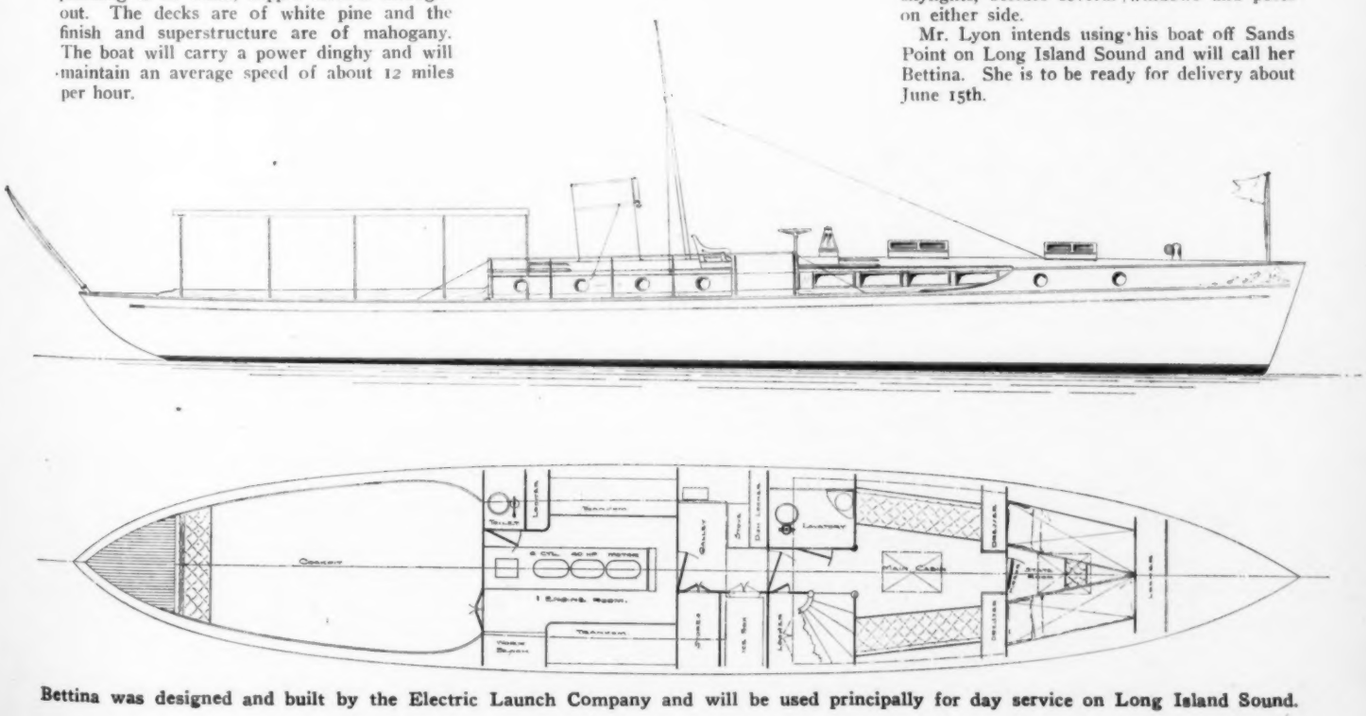
MR. F. G. C. LYON, of New York, has placed an order with the Electric Launch Company, of Bayonne, New Jersey, for a new 61-footer, which will fly the flag of the New York Yacht Club. The new boat, which will be used on Long Island Sound, is 61 feet over all with beam of 10 feet and draft of 3 feet.

In her construction oak has been used for the keel and frames and cedar for the planking, which will be copper fastened throughout. The superstructure will be of mahogany and the interior will be finished in white enamel and mahogany, with the exception of the engine room, in which the finish will be in selected ash.

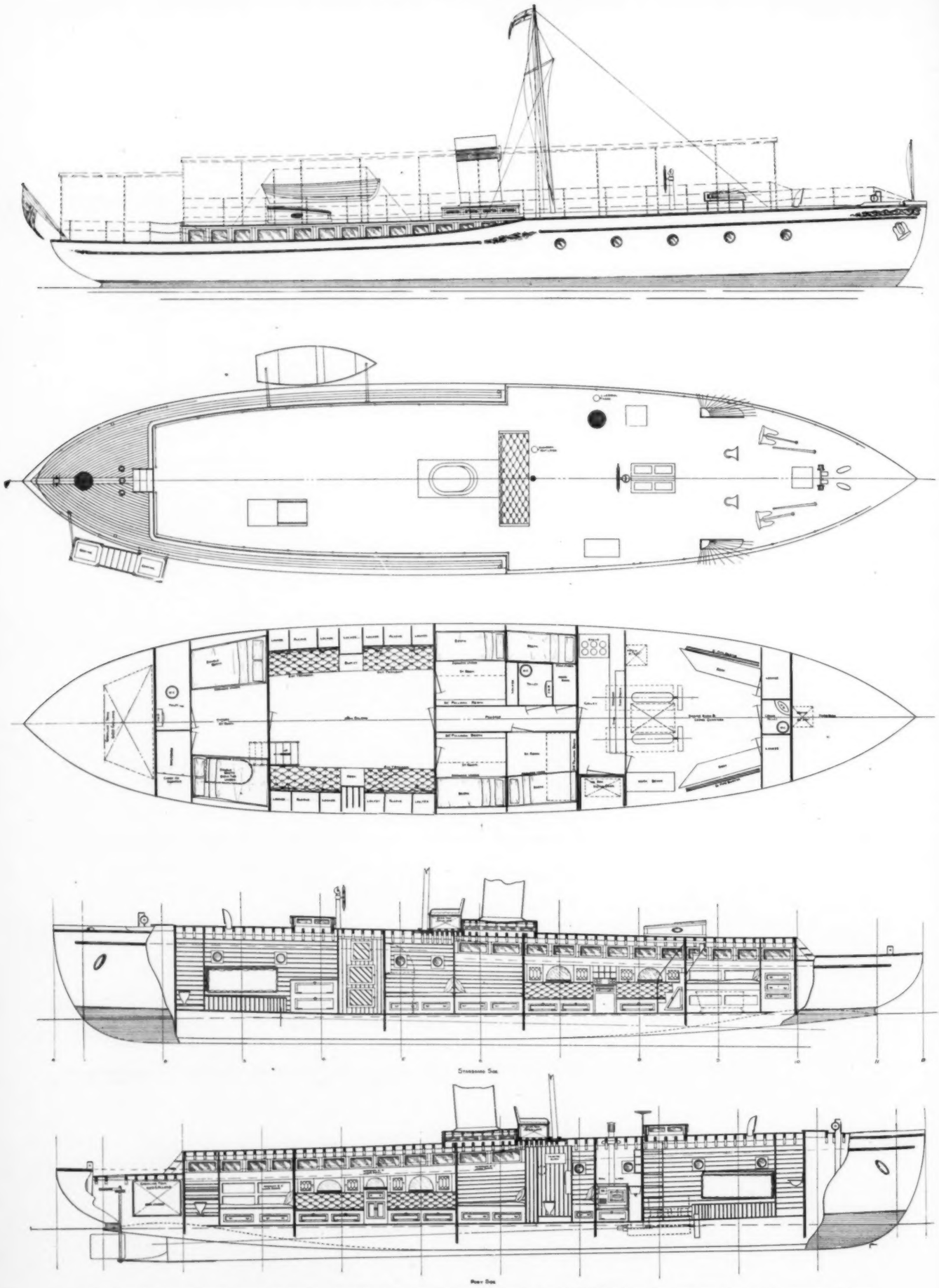
The power equipment will be a 40 h.p., 6-cylinder Standard gasoline engine, which, it is calculated, will give the boat a speed of 13 miles per hour. The motor is installed amidships, the engine room containing two transom berths, a work bench, locker and toilet. Forward of the engine room on the port side is the galley with the usual equipment and on the starboard side are the ice-box and a large compartment for stores. Next forward are the companionway and lavatory, occupying equal spaces to starboard and port respectively. The main saloon, next forward, is provided with two large transom berths with two dressers at the forward end; and the state-room contains two similar berths.

The cockpit is exceptionally large and is kept clear for chairs, with the exception of the seat across the after end. As the boat is to be used principally for day service the cockpit was made larger than is usually the case in a cruiser of this size. Ventilation is provided for in the engine room by large stack and four ports on either side. Over both the main cabin and state-room there are skylights, besides several windows and ports on either side.

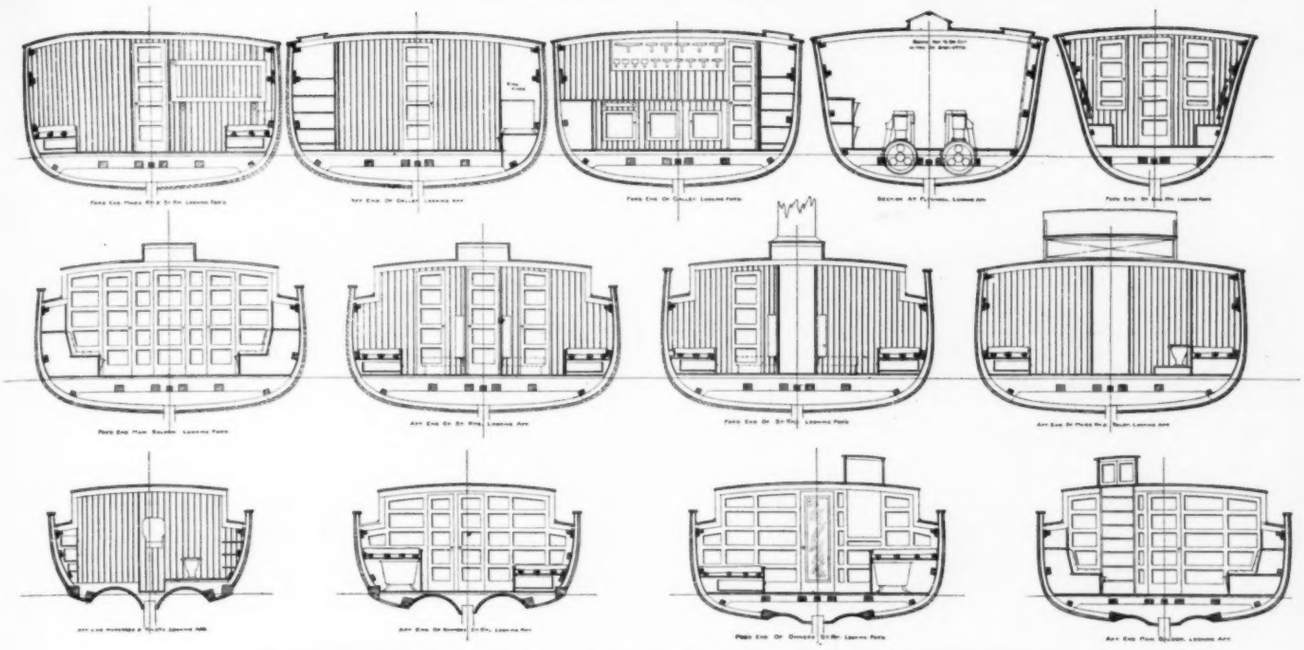
Mr. Lyon intends using his boat off Sands Point on Long Island Sound and will call her Bettina. She is to be ready for delivery about June 15th.



Bettina was designed and built by the Electric Launch Company and will be used principally for day service on Long Island Sound.



Design of the tunnel-stern 75-footer designed by Messrs. Whittelsey and Whittelsey for use on the St. Lawrence River.



Sections of the Whittelsey 75-footer showing her flat underbody and tunneled stern.

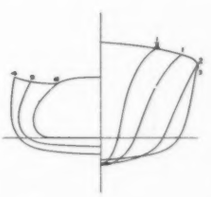
A 75-Footer With Tunneled Stern.

THE accompanying plans are of a very interesting 75-foot, light draft cruising motor yacht, designed by Messrs. Whittelsey & Whittelsey, of New York, for Mr. Henry Burkes, of Toronto, Canada. She is now under construction in one of the Canadian yards and will be completed about June 1st. The design is parficularly interesting in that, to keep the draft down sufficiently to enable the boat to navigate the St. Lawrence River and inland waterways, it was necessary to tunnel the stern, and by building the tunnels in between heavy chime logs and by a system of double planking with canvas laid between the layers, the strength of the hull has been made even greater than in boats of the ordinary design.

The designers have sought to lay out this boat with an idea of securing maximum accommodations, utilizing as much as possible of the deck space, and, at the same time, securing a seaworthy model. The over all length is 75 feet, the beam is 16 feet 6 inches and the draft has been kept down to 34 inches. The design shows a prominent flare forward with a flat under body.

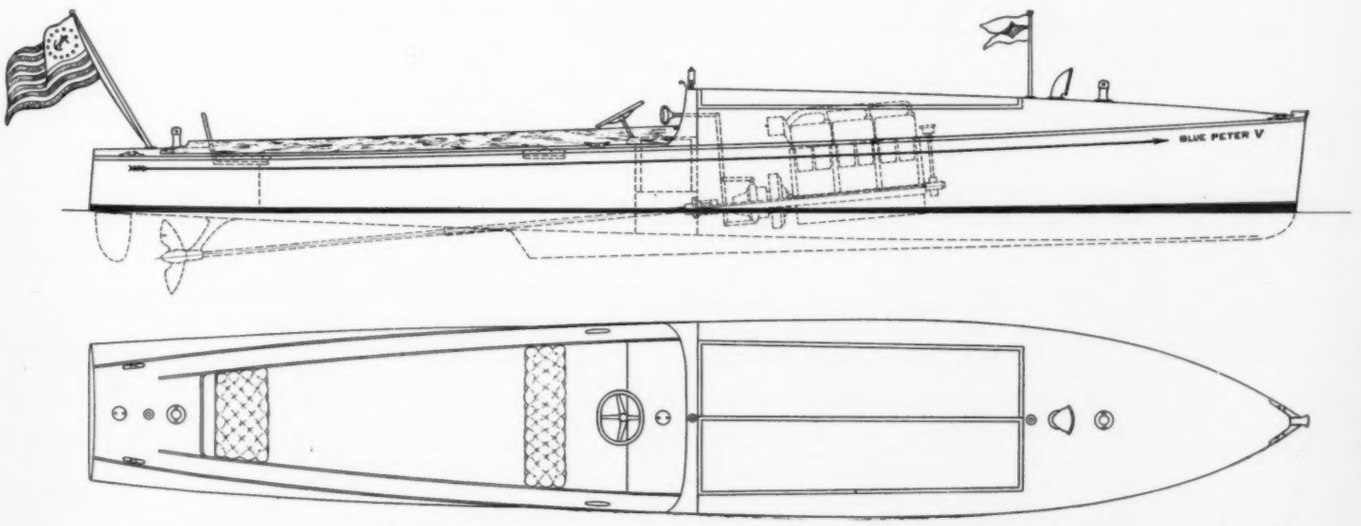
The boat will be propelled by two 25 h.p. Standard engines which are installed in a compartment forward under the deck, which compartment also contains accommodations for the crew. A large galley 4 feet in length by the full width of the vessel is located next aft and is fitted with a coal range, large icebox, sink and dressers. The living quarters amidships consist of toilet and four staterooms, two on either side of a passageway leading from the galley to the main saloon, and in three of which there is, besides the regular berth, an extra berth of the Pullman type.

The main saloon is 14 feet in length and contains extension transoms on either side capable of accommodating four persons when used as berths. Above these transoms are alcoves and lockers and there is a buffet on the port side and a desk on the starboard side. Leading from the after end of this compartment there is a companionway to the trunk cabin roof and a door to the owner's stateroom which extends the full width of the boat and is provided with two double berths beneath one of which is a bathtub. Aft of this room on the port side is a toilet room and on the starboard side a large wardrobe.

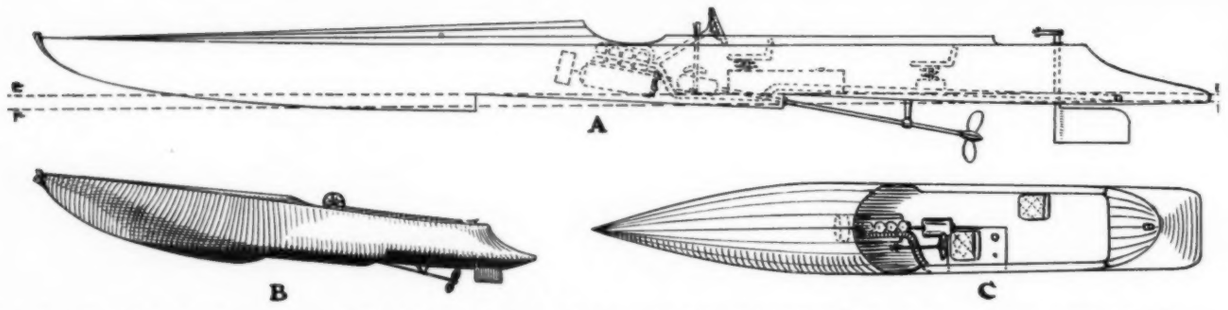


The hull is very heavily constructed, the interior joiner work being plain but very substantially built. The boat is lighted by an electric plant with independent generator. The fresh water supply has gravity flow, the main tanks being beneath the floor and the water being pumped automatically to an auxiliary tank on deck. The gasoline tank, with a capacity of 600 gallons, is placed beneath the after deck.

As will be seen, the entire area of the plan is utilized for deck space and there will be a continuous awning extending from well forward, to the stern. At the after end of the bridge deck there is a seat with a locker under, just aft of which is a large ventilating stack and just forward of which is the signal mast.



Lines of the Lake Placid "one designers" built by the Holmes Motor Company and described on page 17.



A 20-foot British hydroplane of 25-30 H.P. The steps are 4 inches deep and the dotted lines indicate the water line at rest and under way.

An Interesting 45-Footer.

THE accompanying plans are of a very interesting 45-foot cruiser which is being built by the Bath Marine Construction Company for Mr. Harry Thompson, of Boston, for use at Union, Maine. She is 45 feet over all with an extreme beam of ten feet and draft of 3 feet 6 inches. The freeboard at bow is 5 feet and at the stern 4 feet with a least freeboard of 2 feet 10 inches.

The boat is interesting in that she has a cabin aft which differs somewhat from the usual practice. The accommodations are exceptional for a boat of her size, there being five separate berths, divided so that there are three separate sleeping rooms. Forward is the forecastle and galley with a berth on one side and ice chest under the chain locker.

Aft of the forecastle is the main cabin, with transoms along either side beneath which are drawers and lockers and between which is a stationary folding table. Next aft comes the engine room, which connects by a sliding door, with the toilet room to port. The engine, a 25 horsepower, heavy duty Standard, is placed so that it extends partially under the bridge deck and the partitions around it are portable so that access can be had to all parts. On the starboard side of this compartment are lockers, a work bench, tool racks, etc.

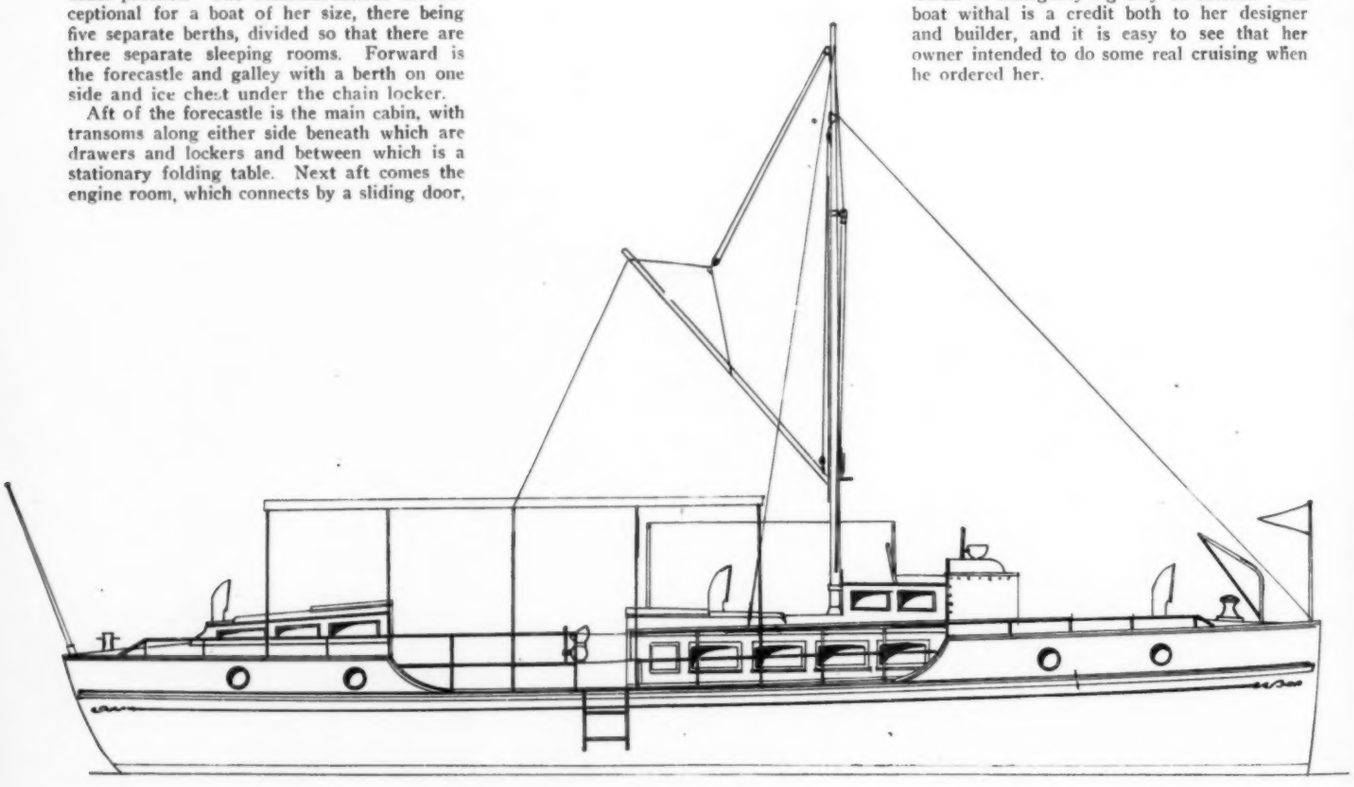
The companionway leads to the cockpit, which, as shown by these plans, is located amidships. Along either side of the cockpit are seats under which the fuel tanks are situated.

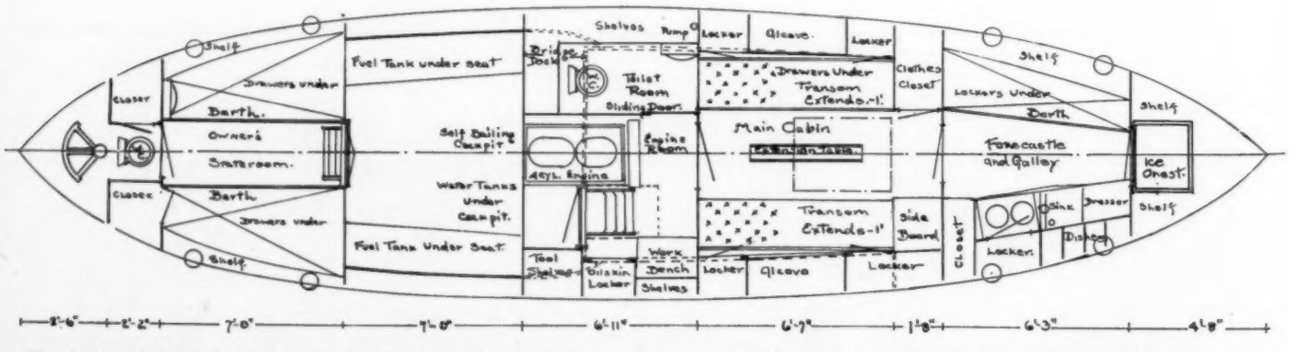
The owner's state-room with two large berths and ample closet room is in the stern, and a companionway leads to it from the after end of the cockpit.

The boat is so arranged that she may be controlled either from the cockpit or from the small bridge forward, a steering wheel and controls being located at both points.

White oak was used for the frames, keel, stem, etc., the planking is of yellow pine and the finish throughout is in African mahogany. A speed of 11 miles per hour is expected.

She is provided with a substantial mast on which an emergency rig may be carried. The boat withal is a credit both to her designer and builder, and it is easy to see that her owner intended to do some real cruising when he ordered her.





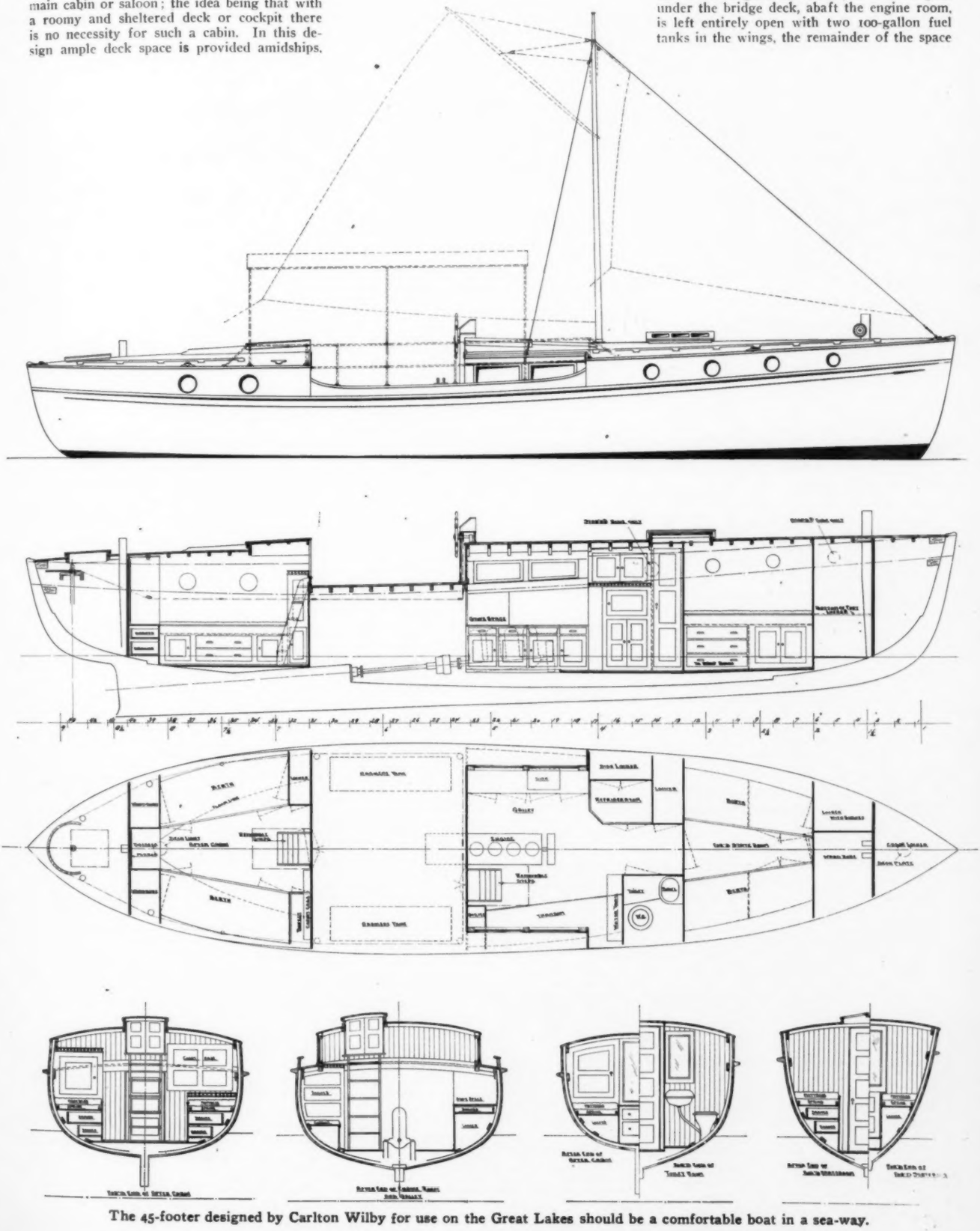
The design of the 45-footer being built by the Bath Marine Construction Company is somewhat of a departure from the ordinary practice.

46-Footer for the Great Lakes

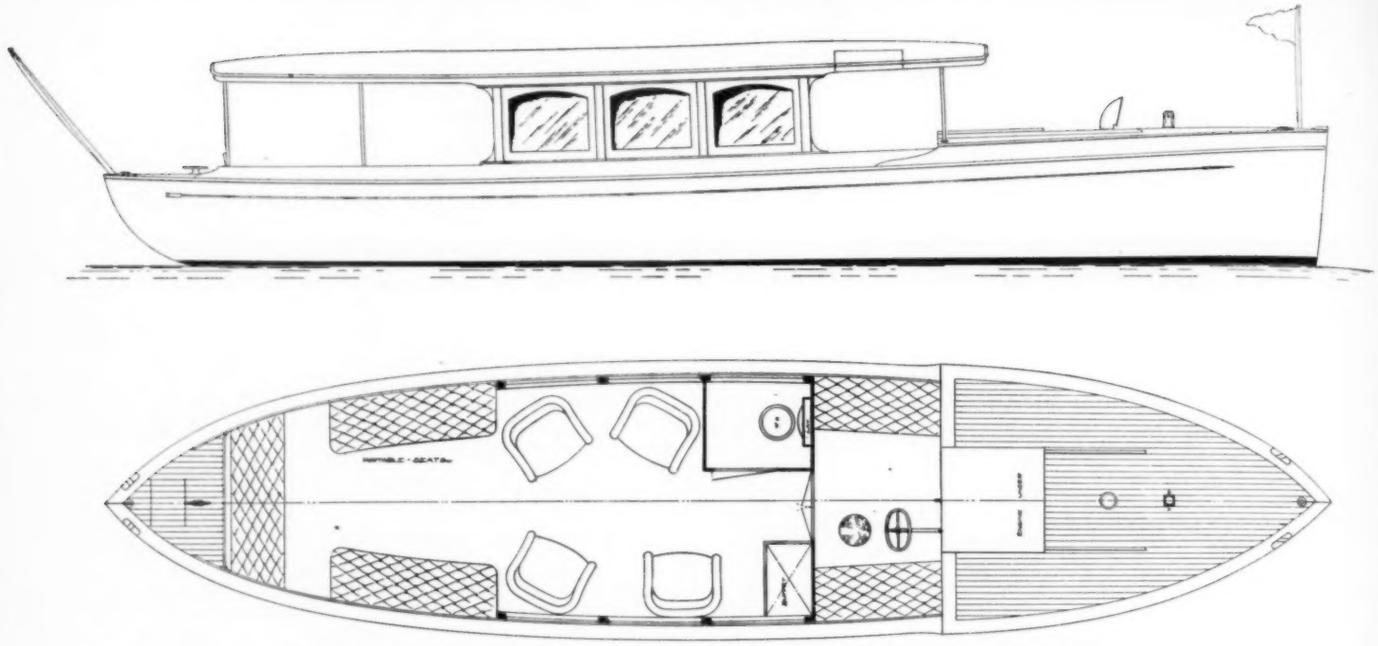
A TYPE of cruiser which is becoming very popular on the Great Lakes is shown in the accompanying plans by Carlton Wilby. This design was prepared for a well-known Detroit yachtsman, who has had considerable experience with modern power cruisers, and the arrangement shown herewith embodies very largely his ideas as to the requirements of this type.

Perhaps the most noticeable feature of the cabin layout is the absence of any so-called main cabin or saloon; the idea being that with a roomy and sheltered deck or cockpit there is no necessity for such a cabin. In this design ample deck space is provided amidships, a space 8 feet by 10 feet being left entirely clear for chairs. This deck is on the level of the main sheer line and is protected by the raised deck cabin forward, by bulwarks at the sides and by the cabin aft. The deck is sheltered by a substantial awning, fitted with side curtains, so that even in bad weather this will be a comfortable spot.

Below decks the ample space allotted to the engine room is noticeable, the engine being absolutely accessible with plenty of elbow room on all sides. The motor will be a four-cylinder Grasser of 25-30 horsepower, which will drive the boat at a good, honest 10 miles per hour. A transom berth for the engineer is located to starboard of the companionway with the toilet room forward of this, while on the port side is located the galley and its equipment of refrigerator, lockers, etc. The space under the bridge deck, abaft the engine room, is left entirely open with two 100-gallon fuel tanks in the wings, the remainder of the space



The 45-footer designed by Carlton Wilby for use on the Great Lakes should be a comfortable boat in a sea-way.



The design of the Mathews 35-footer is a combination of the cruiser and the runabout.

being used for storage. This arrangement of engine and fuel tanks amidships insures proper trim under all conditions of loading and is also desirable in a seaway.

The after cabin is devoted to a ladies' stateroom with berths on either side, wardrobes, dresser, etc., and a head room of 5 feet 6 inches is obtained under the carlins. The men's cabin is located forward, with ample locker space provided under the berths and in a large wardrobe forward. A head room of 6 feet 2 inches is obtained throughout the entire length of the forward cabin.

An emergency rig with a loose-fitted mainsail and staysail is shown, which will be enough to give steerage way in case of necessity; the principal dimensions are as follows: Length over all, 45 feet 10 inches; beam, 10 feet 6 inches; length on the waterline, 42 feet; extreme draft, 3 feet 2 inches and least freeboard, 3 feet.

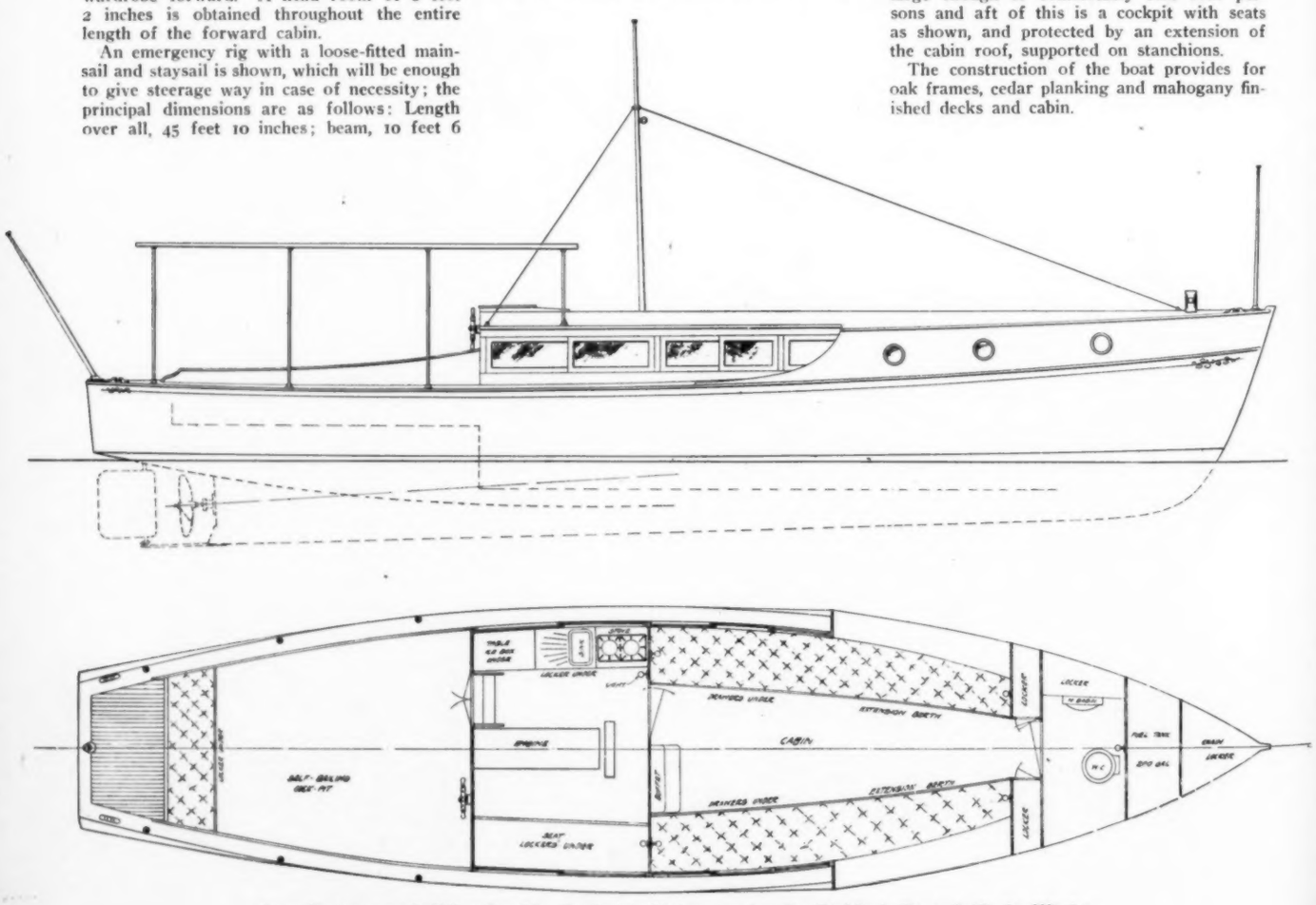
A 35-Foot Day Cruiser.

THE day cruiser shown in profile and plan is being built by the Matthews Boat Company, of Port Clinton, Ohio, for Mr. E. A. Darling, of New York. This boat is an interesting combination of the runabout and cruiser. The motor, which is placed forward under the deck, is a 25 horsepower, four cylinder Jager, equipped with Bosch ignition system.

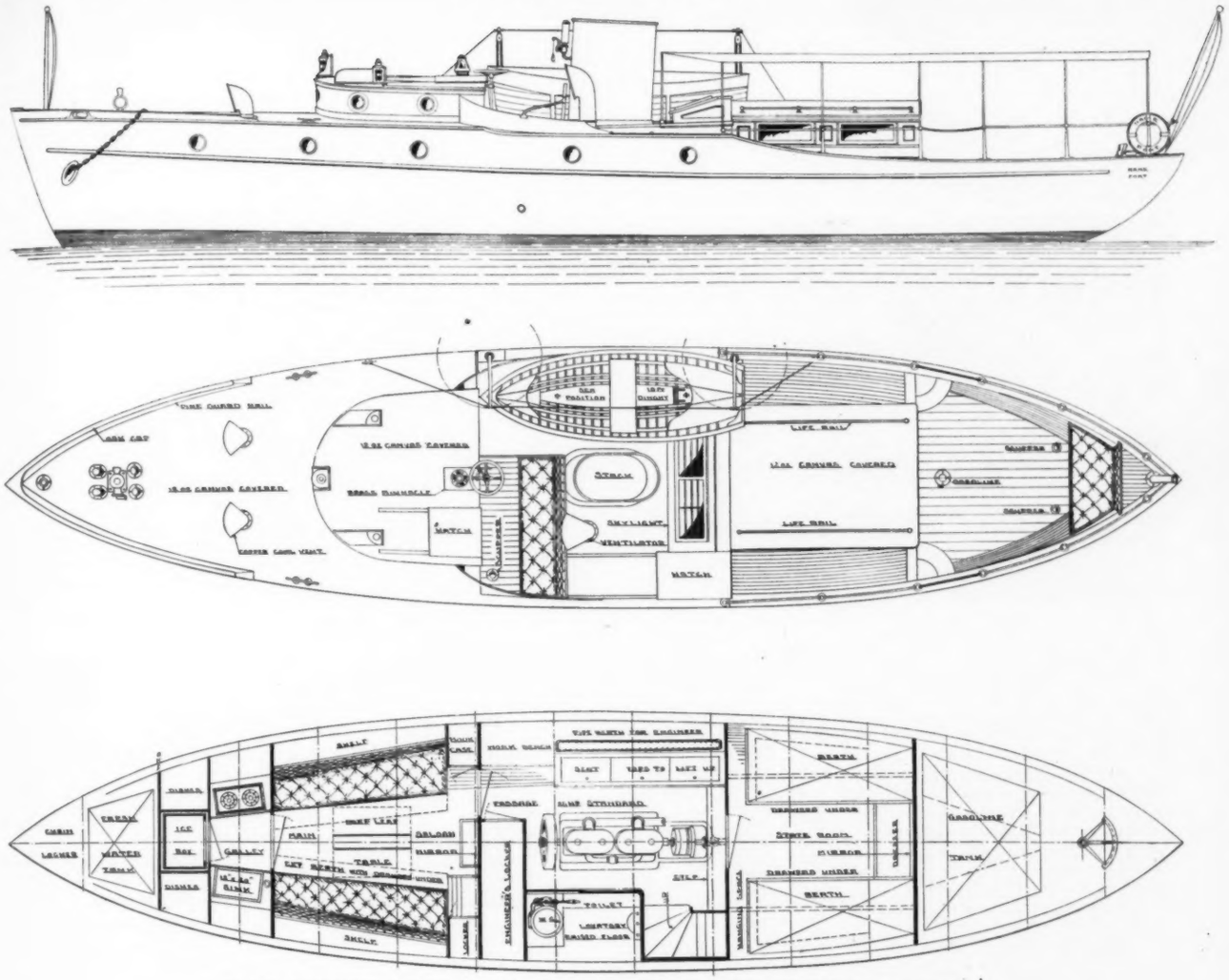
Aft of a bulkhead upon which are mounted the steering and control equipment is the operator's cockpit, which is protected by an extension of the cabin roof.

Amidships and separated from the operator's cockpit by a panelled bulkhead is a cabin large enough to comfortably seat four persons and aft of this is a cockpit with seats as shown, and protected by an extension of the cabin roof, supported on stanchions.

The construction of the boat provides for oak frames, cedar planking and mahogany finished decks and cabin.



A 42-footer now building for Mr. Frederick Haberman by the Ruddock Boat & Yacht Works.



In Mr. Anderson's design of a 45-footer none of the available space has been wasted.

A 42-Foot Cruiser.

MR. FREDERICK HABERMAN is having built at the yards of the W. F. Ruddock Boat and Yacht Works a 42-foot cruising launch from the designs by Mr. Ruddock, which are shown herewith.

The boat is 42 feet 6 inches over all and 39 feet on the waterline and will be equipped with a 20 horsepower Standard engine which will drive her at a good cruising speed. She is 10 feet 3 inches in the beam and will draw about 2 feet 6 inches.

As to her construction, the frames are of white oak and the planking of one inch white cedar, with the exception of the top strake, which is of oak. The cabin trunk is of selected mahogany, as is also the interior finish. The cabin roof is of cypress, covered with 10 ounce canvas.

The interior is well laid out, there being a chain locker in the extreme bow, aft of which is a 200 gallon fuel tank of heavy copper. A 3-foot toilet room is next to the tank compartment and contains the usual fittings, besides a good size locker. Next comes a 14-foot saloon, which contains extension transom berths, capable of accommodating four people. A buffet is placed against the after end of the saloon and beside it is the door leading into the engine room and galley. The engine room is 6 feet 6 inches long and contains a complete galley, besides the seat and locker for the engineer.

A companionway on the port side leads to a self-bailing cockpit, 11 feet long, which is left open for chairs, except for a wide seat built in the after end. The cockpit floor is of calked white pine and above it there is a canvas awning supported on pipe stanchions.

A military mast will be placed as shown in the design and equipped with an electric riding light, and a hand rail will be run around the top of the cabin trunk.

The boat will be completely lighted with tungsten lamps, the current for which will be supplied by an Aplco generator and storage battery. All fittings will be of polished brass and the boat throughout, when she is completed, will be a creditable addition to the New York fleet.

The after state-room is 7 feet 2 inches in length, and contains two berths with drawers under them, a dresser and mirror and two hanging wardrobes. This compartment is to be finished in mahogany and white enamel.

A cockpit occupies the after end of the boat and its floor is dropped 26 inches below the deck. In the after end is a seat with a comfortable lazy-back, and the rest of the cockpit is left open for chairs. A canopy extends from the stack to the stern and the stanchions of this also support a guard rail. A 10-foot dinghy will be carried amidships as shown.

This boat is expected to make 11 miles an hour and should behave well in a seaway, as the bow sections have considerable flare, the draft is liberal and the weights are well distributed.

The Ruddick Company is also building several other cruisers among them a 38-footer of 8 feet 9 inches beam and extreme draft of 3 feet. The interior of the boat, the lines of which are somewhat similar to the 42 footer just described, instead of being thrown into a single cabin is divided into a cabin and a state room. Instead of being placed forward the toilet room is in the engine compartment where is also located the galley and a fifth transom berth.

A Trim 45-Footer.

THE outboard profile, deck and general arrangement plans of the 45-footer shown herewith are from the design by W. E. Anderson, of Albuquerque, New Mexico. The principal dimensions are: Length over all, 45 feet; waterline length, 39 feet 10 inches; draft, 3 feet 10 inches; and the construction throughout is fairly heavy.

The arrangement is laid out to sleep six persons comfortably. In the extreme bow is the chain locker. Next to this is the galley of ample size, containing stove, sink, dish racks and a good sized refrigerator. Aft of the galley is the saloon with two extension berths, under which are drawers. The backs of the transoms are hinged to the shelves above and lift up, forming additional berths. A small bookcase is on the starboard side and across from this a stairway leads to the bridge deck above. There is also in this compartment a small locker, mirror and a drop-leaf table, all to be finished in mahogany and white enamel.

Aft of this compartment is the engine room, in which will be installed a 25 horsepower Standard, the exhaust from which is led up through the stack above. In the forward end and on the port side is a locker for the engineer, filling the space beneath the bridge deck. Aft of this locker is the toilet room, which is provided with a sliding door. Next is the stairway, which leads to the deck above. On the starboard side and across from the engineer's locker is a small work bench fitted with a vise and drawers beneath. Aft of the bench is a permanent seat above a locker for tools, packing, waste, etc., and above this seat is a folding pipe berth for the engineer.

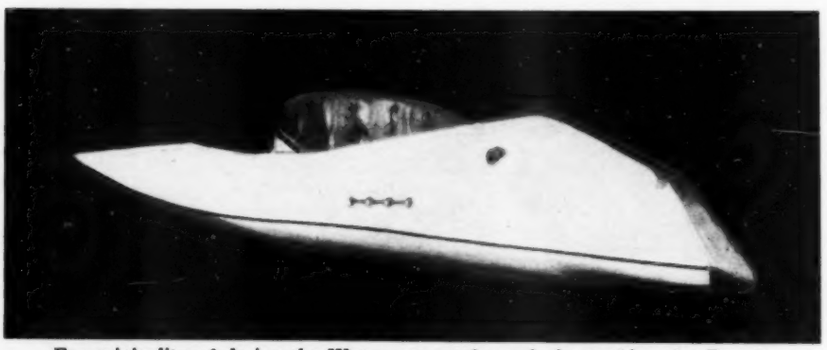
The tender of the U. S. Battleship Chester on her trial trip.

New Battleship Tender.

THE accompanying illustration shows the new tender for the United States battleship Chester, on her trial trip. She is 35 feet long, with a beam of 7 feet, and has been equipped with a 40 horse, heavy duty Sterling engine, giving her a speed of 10.7 knots and making the weight complete, 8,400 pounds. This is but a single instance of the numerous cases where the gasoline tender has superseded the steam driven boat. A boat of the same size, equipped with a steam plant weighs 15,000 pounds and has a speed of only 7½ knots and, of course, has a capacity somewhat less than the boat here shown, which is carrying 15 men. There is a growing tendency to replace government steam tenders with those using gasoline or oil.

At 17 miles per hour the Gray 26-footer creates very little disturbance.

This peculiar runabout was exhibited at the recent Chicago motor boat show and needless to say created considerable interest.



For originality of design the Waterman runabout rivals anything the French have produced.

A Striking Departure.

THE Waterman Marine Motor Company have recently built a runabout, which for originality of design rivals any of the late French productions. It is difficult to describe the boat, as it is unlike anything yet produced, but the accompanying illustration gives a comprehensive idea of its lines. Starting with a sharp point forward, the upper body, which has no dividing line between deck and sides, is highly crowned to a point about one-third of the way aft, where it slopes down to a broad, thin, flat stern.

The motor is installed forward and there is a small cockpit with automobile seat for two persons. Withal the boat has the appearance of some sea monster, which thought is accentuated by the two bulging side lights, which, as will be seen, have the appearance of eyes.

26-Footer for Mexico.

A FAST 26-footer has recently been constructed by the Gray Motor Company and shipped to Captain Shillaber of Tampico, Mexico, who is in charge of the Tuxtam canal construction. The boat has a 5 foot beam and 10 inch draft and is equipped with an 18 horsepower, 3 cylinder-Gray motor, which propels it at a trifle over 17 per hour, at which speed it creates very little disturbance, as will be seen by the accompanying illustration taken at full speed. Electric lighting outfit has been installed and the controls are all brought to the bulkhead. The boat is planked with cedar and the deck and inside finish are of mahogany. All joints and cracks were first treated with a preparation of carbolineum, which will prevent dry rot and the action of the teredo so destructive in southern waters.

A Motor Gunboat for Salvador.

THE Gas Engine & Power Co., and Charles L. Seabury & Co., Consolidated, Morris Heights, New York city, have recently completed a 40 ft. open gasoline launch of a new type, which was shipped to the government of Salvador, to Acajtla, via Panama R. R. and Steamship Co. It will be taken to Colon by steamer, and then by rail to Panama, from there it will be transferred to another steamer for shipment to Acajtla. This boat is 40 ft. over all, 10 ft. beam, has exceptionally high freeboard, and was designed and built to carry about 60 men.

The hull is very strong and substantially constructed of wood, the bottom being sheathed with copper from the keel to 6″ above the water line. The motive power consists of a 4 cylinder, 32 to 40 H.P. Speedway motor, arranged for one man control. A gun mount was arranged on forward and after deck, to take care of a one pounder gun.

The name of the boat is "San Vincente" and she is undoubtedly a distinctive type of motor boat. She is built somewhat along the line of the boats used by the United States Life Saving Service and is well adapted for the hard service which will be required of her. A glance at the illustrations will show her great carrying possibilities and seaworthiness, and with her capacity of 60 men she should be able to carry a great percentage of Salvadore's army.

San Vincente was built for the Government of Salvador.

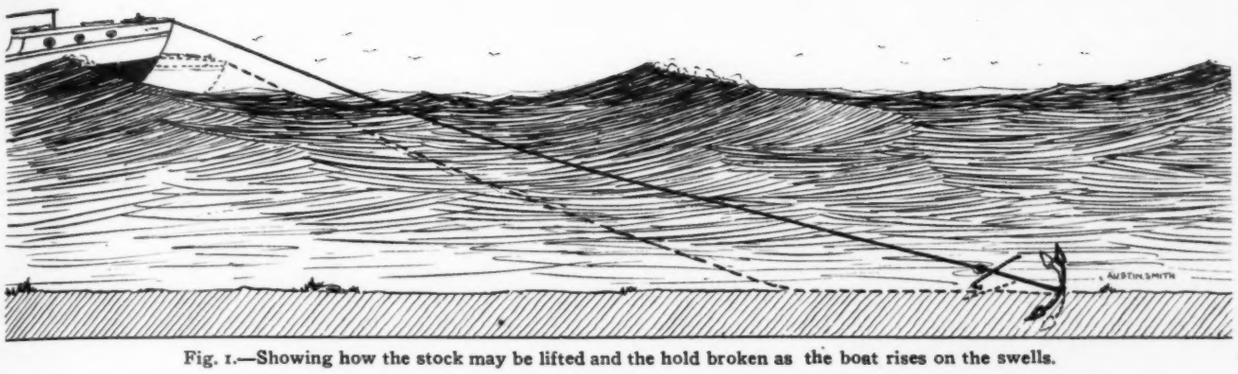


Fig. 1.—Showing how the stock may be lifted and the hold broken as the boat rises on the swells.

Anchors and How to Use Them.

The Principal Types of Anchors That are Suitable for Motor Boat Conditions. The Purpose for Which They are Adapted and Suggestions for Their Use.

By W. E. Partridge.

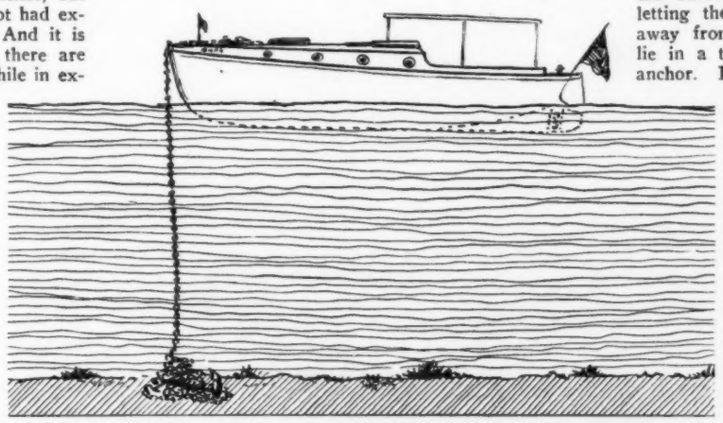
THE motor boat is made to go and when in use going is the chief part of her business, but occasionally it is necessary to anchor. Anchoring usually is not especially important but there are occasions, which are liable to come to almost every boatman on wide waters when the ability to anchor and to have his anchor hold is a question of utmost importance.

Most men who own boats are supposed to know when they ought to anchor, but some of the beginners have not had experience and do not know. And it is important to remember that there are few persons who can think while in extreme danger. Those who are coolest are those who have given the situation careful thought beforehand.

The question naturally arises: When is it usually necessary to anchor? A few cases may be mentioned when it is important, as, for example, when the wind is blowing hard upon the shore and the engine stops. It will be admitted that even today there are some engines on the market that may stop unexpectedly, if, for instance, the gasoline goes dry. If the shore be near and the water is not too deep anchoring is the proper thing unless there is sail power by which the craft can be worked off shore. In a wind hard enough to smash a boat if she goes on shore there is small probability that she could be worked into a position of safety with the oars.

Again, in a gale outside, the wind and sea become too heavy for the boat to face with the engine running. The engine may not be sufficiently powerful, fuel may be exhausted and the engine may have stopped or the boat may not for various reasons be able to run before the gale. Safety then lies in riding head to the sea—in a word, in anchoring. In such cases as these it is a question of the utmost importance, and a proper sea anchor and fittings may save the boat and perhaps lives.

Every boat should have an anchor heavy enough to hold her in any sea she is likely to encounter. This of course supposes that she is to be used at sea or on the Great Lakes, for boats on small lakes and rivers are not likely to need an anchor for anything more than to hold them for fishing. Unless there is a swift current a five or ten pound anchor will answer every purpose if there be sufficient cable. In still water ten or fifteen feet more than the depth of water may be all that is needed.



If the chain is not paid out gradually it is likely to foul the anchor.

When the anchor has real work to do we have a very different set of conditions. The boat rises and falls on the sea, giving a tremendous jerk on the cable at each rise. If this comes directly upon the anchor it lifts the stock destroying the hold of the arms upon the ground which is broken up, allowing the anchor to drag.

When the anchor is dropped, a lot of chain must not be dropped on top of it, because the anchor is pretty sure to be fouled, that is, entangled in the chain. This prevents the anchor from holding. Drop the anchor and pay out chain as the boat drifts, but see that the boat's headway is stopped before letting the anchor go. As she drifts away from the anchor the chain will lie in a tolerably direct line with the anchor. In the former case the chain will certainly take a turn about a fluke and the anchor will hold no more than a like weight of metal lying on the bottom.

How much chain should be payed out depends on how hard it is blowing and whether there is any prospect that the boat will drag her anchor. When there is any sea running and the chain is short every time the boat rises on a swell the chain is straightened as shown by the solid line in Fig. 1. This lifts the stock and works the flukes so they do not have a firm hold on the bottom. Dragging is pretty sure to follow.

The chain should be so long that in rising on the sea the anchor is not disturbed. Sometimes a second anchor is let go, fastened to the main chain or a heavy weight is attached to the chain (see Fig. 2), which prevents it from lifting or disturbing the main anchor. This is more effective than two anchors with separate cables of short length.

What length of chain is needed depends very much upon what water one is anchoring

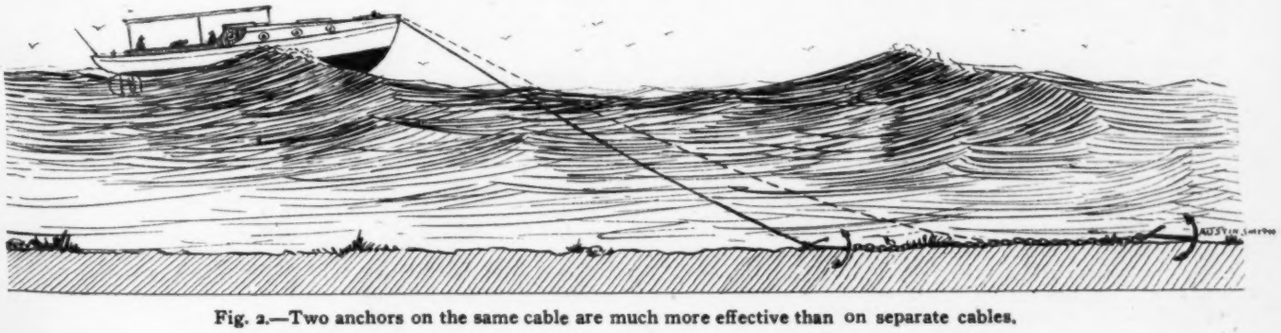


Fig. 2.—Two anchors on the same cable are much more effective than on separate cables.

in. It also depends on what is to be used for a cable. The heavier the chain the less is required to lie flat on the bottom and to prevent the upward surge of the boat from lifting the stock of the anchor.

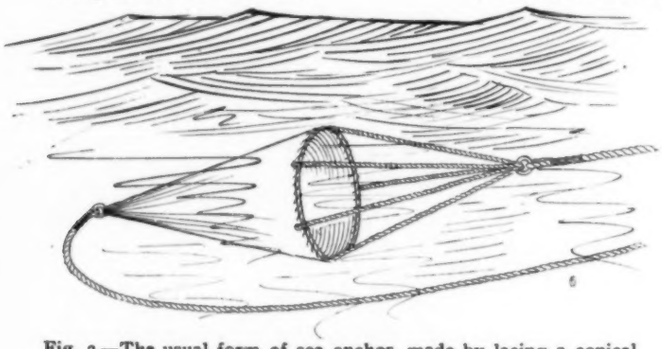


Fig. 3.—The usual form of sea anchor, made by lacing a conical canvas bag to an iron hoop

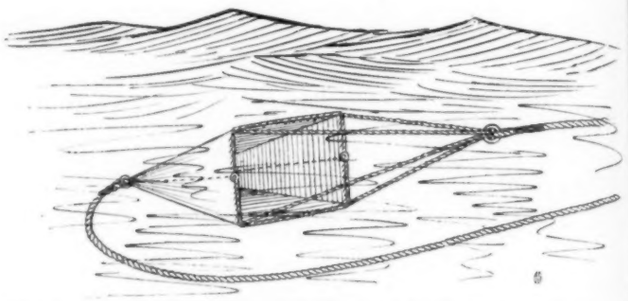


Fig. 4.—If made with a hinged frame the sea anchor is more compact when folded.

There are rules relative to the amount of cable which should be payed out for different depths of water so as to have the anchor rest under the snubbing of the boat. They are of small interest to the motor boatman, however, for the reason that he is rarely willing to buy cable enough, and if he should happen to have a sufficient quantity, does not want to pay out a fathom more than will hold the boat,

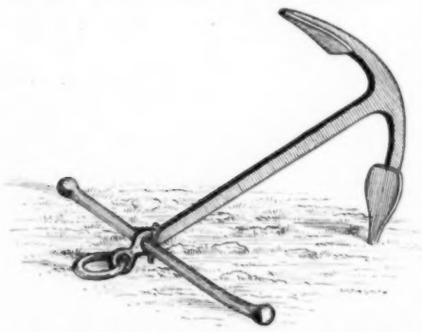


Fig. 5.—The kedge anchor may be had in any size.

for he knows he must later get it all up again. Fifty or sixty feet of chain on the ground is sometimes enough to hold a light, sharp boat, while a bluff bow and heavier boat may call for 100 or 150 feet on the bottom. The writer knows of a case in the shoal water inside of Sandy Hook, south of Staten Island, where it was necessary to bend on 600 feet of cable to ride out a severe gale. One hundred feet of this next the anchor was chain. As the gale increased one cable after another was bent on.

What is the best anchor for a motor boat depends on many things. First is the size of the boat and second the water she is used in. Generally we suppose that the motor boat should have a folding anchor, because stowage

Fig. 6.—Trawl with flukes rounded to prevent fouling.

room is more important that the small difference in price between the solid and folding anchors. For inland waters almost any small size will answer, as the holding power needed is small. On the ocean and the Great Lakes, however, when one may have to hold on for life, very much larger anchors are needed. Estimating by the tonnage, a boat of 1 to 1½ tons requires a 20-pound anchor. Two tons, 30-pound and four tons, 50 pounds. The chains for these should be 3/16 inch for the smallest and ¼ inch and 5/16 inch for the others. Regardless of tonnage a 30-foot boat should have a 50-pound anchor, though most men would consider 30 pounds sufficient. All the common forms of anchors are made in sizes as small as four pounds. These are from 17 to 18 inches in length, and they are suitable for holding small boats when fishing.

Anchoring involves something more than pitching an anchor over the bow and paying out chain. The first thing you wish to know after the anchor is down is whether it is holding. If the shore is in sight or there are any fixed objects abeam, a sight should be taken so as to determine whether the boat moves. But, as the boat rides from a long cable, she will swing back and forth across the wind, which may give the impression of her having lost a little. But if she is really holding on she will swing back again. In fog or rain, or when there is no object near enough to take a sight upon, put a line over the side with the lead or any weight on it. Let it rest upon the bottom, give it plenty of line and from time to time see whether the line is vertical or whether the weight is forward of the point when it was thrown over, relatively to the boat, of course. With a lead on the bottom it is easy to determine whether a boat is swinging or really drifting.

"Outside" it often happens that the weather is so bad that you cannot run, or some accident calls for "laying too." A sea anchor is then the only resource. This is essentially a canvas bag attached to a ring or frame floating in the water. The boat rides to it as to an anchor, owing to its resistance to motion through the water.

The sea anchor is often extemporized, though not always conveniently, and it is advisable to have the real thing on board. Fig. 3 shows a convenient form. To an iron ring 30 or 36 inches in diameter a conical canvas bag is laced. To the point of the bag a "tripping line" is fastened. Six lines are fastened around the hoop at equal distances and brought together into an eye to which the anchor rope, or cable is fastened. When in the water the resistance of the bag is very great and it acts like an anchor, keeping a boat head to the sea. It is taken in by hauling on the tripping line.

Sometimes a sea anchor is extemporized from a sail on a piece of canvas, lashed between spars, boat hooks, or oars, forming a triangle. The point is weighted so that the triangle will float vertically and a span is rigged from each corner. A square frame of wood and iron can be made to hinge and a bag fitted to it so that it will fold very compactly. See Fig. 4.

The first anchors were stones fastened to a rope and thrown overboard to hold by their weight alone and were used to hold boats or rafts in place while men were fishing. It was soon found that the stone slipped easily along the bottom and was not handily fastened to a rope. The anchor was easily lost, and a brisk wind set the boat drifting, in spite of the anchor.

The next thought of the primitive man was to give the stone some sort of a hook, to prevent its sliding over a muddy bottom. This idea took the form of a sapling with a branch to which a stone could be fastened. To this day the natives of Ceylon use this type.

When metal was used for anchors men very soon decided upon the proper form which has practically been unchanged for a thousand years, and perhaps more. It consists of a stock, lying horizontally when the anchor is on the ground, a shank with a ring and at the opposite end two arms, on the ends of these are the palms or flukes. The end of the stock is bent so that when the key is

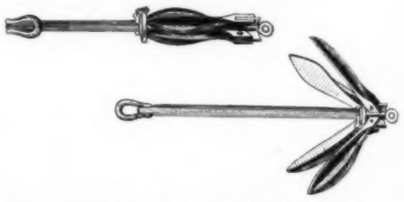


Fig. 7.—The Chester is held either open or closed by a ring and pin.

drawn out the stock can be pulled through the shank to the bent end and slid alongside the shank without separating the two.

The stock and the arm are at right angles to each other and the arms are placed at a little less than 45 degrees to the shank. The object of this arrangement is to insure the anchor getting a proper hold on the ground. When it is dropped from the vessel it strikes upon the crown and then falls over upon one side. Whatever may be its position in falling a pull upon the chain brings the stock flat upon the ground and one of the arms down with the point on the bottom. A continuation of the pull upon the chain tends to draw the fluke into the ground. The angle of the arms with the shank makes this certain with any kind of good "holding ground."

The folding of the iron stock along the shank was the first step toward making the

Fig. 8.—The flukes of the Babbitt work on either side.

anchor stowable, for in its ordinary form it is about as uncomfortable a piece of furniture as can well be imagined.

Of styles of anchors for ships there are an endless variety, but the motor boatman is more concerned with various kinds of folding anchors.

The anchor shown in Fig. 5 is called a

kedge anchor and is made regularly in all sizes from 4 pounds in weight, and a trifle more than 15 inches in length, up to 20 pounds in weight and 34 inches long. These sizes vary from each other only by a pound or two.

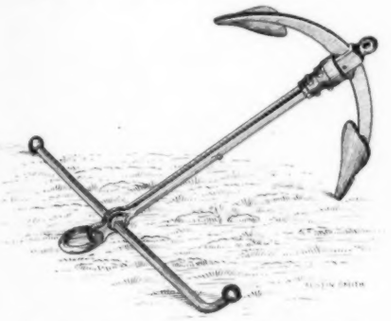


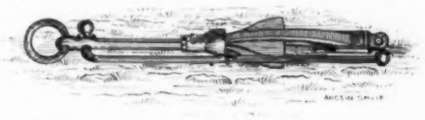
Fig. 9.—The Cape Cod folding anchor.

Then increasing by 5 pound differences they go up to 100 pounds and by larger differences to 500 pounds, which is quite as large as any motor boatman will be interested in.

The iron stock fishing anchor is of the folding type and is intended to get a firm hold of the ground at once. Its flukes are somewhat rounded at the base to prevent fouling, and in the trawl anchor (Fig. 6) the rounding of the flukes is carried still further.

We shall not pretend to be chronologically accurate but we fancy that the next anchor to fold was the Chester, shown in Fig. 7. This is a stockless anchor with four flukes. These four flukes are held open by a ring which slides on the stock. When the flukes are open the ring slides to the bottom of the stock and is held fast by a key which is secured to the ring by a short bit of chain. In this position it keeps the flukes open. A hollow in the under side of the ring secures the points from spreading when they are closed. There is a ring at the crown to hold a "tripping line" to take the anchor out of the ground.

There is another form of anchor which may be classed as folding because it is quite compact and on big ships stows more snugly than



The Cape Cod is compact when folded.

any others, for it hoists right into the hawse holes and stays there. The first one of the kind, we believe, was the Trotman. These anchors have two palms, or flukes working together and hinged at the crown. For boat use the Babbitt anchor, shown in Fig. 8 is of this type. Whichever way it falls the flukes are supposed to bite into the bottom and consequently no stock is needed. They are made with an eye for a tripping line, for they would be subjected to a needless strain in breaking out of a hard bottom or on a rocky place if lodged in a crack. In general the folding an-

The same pins hold the Dirigo either opened or closed.

chors are not as strong as those forged solid and for that reason breaking them out of the ground with a tripping line is always advisable, but they hold well, perhaps too well for their own safety.

After the Babbitt comes the Cape Cod folding anchor. This in general form is the same as an ordinary anchor, its only difference being in the crown in which there is a joint. The two arms fold up along the shank. (See Fig. 9). This anchor folds in a flat, compact form. It is made in sizes from 4 pounds to 100. The last being large enough for most motor boats.

The Dirigo Folding Anchor, shown in Fig. 10, has both folding arms and folding stock.

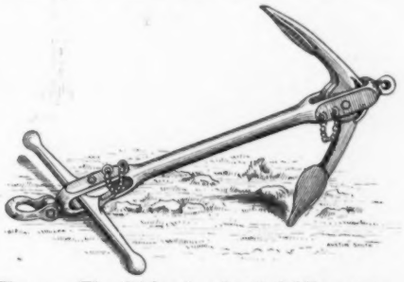


Fig. 10.—The Dirigo has botth folding arms and stock.

A single pin at stock and another at the crown secure the parts both open and closed. There is no loose part to slide up and down the shank. This anchor is made regularly up to 75 pounds and other sizes are obtainable to order. When open it is practically of the standard form.

These comprise most of the anchors which the motor boatman is likely to meet with, and unless he is thinking of a mooring, all that he needs. For a mooring, of course, the mushroom in some of its varieties is considered most secure.

Finally, when a man wants an anchor in time of storm he wants it badly. If it is not actually a case of life or death it is apt to be a serious risk of property and a few pounds of extra weight is a small consideration compared to the satisfaction of knowing that your anchor is going to hold. A safe way is to use a light anchor, a short piece of chain and a rope for ordinary occasions and to carry a heavy anchor and a good long chain for use in emergencies. With this equipment the small anchor may be used in connection with the larger one as previously described.

Simple Tests With Lubricating Oil.

Cylinder Oil for the Gasoline Engine and the Characteristics That It Should Possess. A Few Easy Experiments That Enable the Motor Boatmen to Determine Its Quality.

By C. Peterson.

NEARLY everyone knows that it is impossible to lubricate, with ordinary vegetable or fatty oils, any surface over which gasoline vapor has access, since gasoline is a solvent for these oils and owing to the fact that the temperature within the walls of an internal combustion motor varies between 1,800 and 2,000 degrees Fahrenheit, it is imperative that an oil be used that will not burn readily or vaporize easily; should spread quickly and when it does burn do so without leaving any deposit. The importance of a quick spreading oil should not be overlooked because, if its function of keeping the surfaces apart be not followed, the increased heat from friction will doubtless result in the seizing of the piston.

Oil experts agree that the proper lubricant for gas and oil engines should be a pure petroleum oil having the following characteristics:

Flash, 400-475; viscosity, 80-85 (Doolittle.)

As this article is to deal with these and other tests for oil, it may be not out of place to define them.

The viscosity of an oil is the degree of fluidity it possesses or the amount of resistance its particles or atoms oppose to separation. It is determined by observing the temperature and time a measured sample of the oil takes to pass through the small end of a pipette. The greater the viscosity the longer the time.

Unfortunately there is no recognized standard apparatus for this test and in order to be of any value a viscosity report must give the name and make of the instrument used during the test.

The flash point is the temperature to which a measured sample of the oil must be heated to cause it to give off a vapor which will ignite when mixed with air and exposed to flame.

The fire test determines the temperature at which the oil itself ignites and continues to burn.

The specific gravity is the ratio of the weight of the oil to that of an equal volume of water.

With the possible exception of the gravity test the foregoing is out of the reach of the ordinary layman as they require quite elaborate scientific apparatus together with laboratory conditions.

However, there are a few tests that may be made at home with perfect safety. They have been suggested by such distinguished oil chemists as Davis, Redwood, Hutton, Archbutt; men with international reputations, and if the reader will take the trouble to follow them out he will be amply repaid.

In order to test for adulterants, take a small measured quantity of the oil and mix with about 0.1 its bulk, caustic soda previously dissolved in 95% alcohol. If, when cool, the oil becomes gelatinous or solid, it is proof that it has been mixed with a fatty oil.

Sometimes the viscosity is raised by thickening the oil. To test for this, weigh out a small quantity of the oil and ignite it in a crucible, then place the crucible in the flame of a Bunsen Burner until all the carbon is burned out. If there is any ash, weigh it and if it is over 0.1 the original bulk, there is no doubt as to the presence of a thickening agent, generally aluminum oleate or metallic soap.

For the gumming test take just enough of the oil to cover the bottom of a shallow dish, then heat the whole to 250°F., remove from the heat and allow the dish to cool very slowly. When cold there should be neither a gummy residue either in the dish or in the oil.

The acid test is extremely simple. Take a small quantity of the oil and rub it on polished brass. At the end of 24 hours the brass should not be green in color, else there is an acid in the oil.

Frequently in the refining process foreign matter is carried over. In order to detect this tarry or suspended matter take about 3 ounces of gasoline and mix thoroughly in a test tube with about 1 ounce of the oil. After letting the mixture stand for about ten minutes any tarry or suspended matter will be precipitated.

These tests are very simple, do not require any great amount of preparation in the matter of apparatus and should meet with entire success.

Scenes along the course of the new canal. In the lower left hand picture the excavators are seen clearing the way for the dredges and in the right hand picture is shown one of these huge machines digging the ditch in which it floats.

Scenes along the course of the new canal. In the lower left hand picture the excavators are seen clearing the way for the dredges and in the right hand picture is shown one of these huge machines digging the ditch in which it floats.

The canal connecting the St. Johns and the North River, although still to be deepened in places, is now open to the motor boat.

The Last Link in the Florida Chain.

The Inland Route for Motor Boats Between Jacksonville and St. Augustine Now a Reality. A Canal Connecting the St. Johns and the North River Has Recently Been Opened.

ONE of the greatest engineering enterprises in the history of the state of Florida and one of vital interest to thousands of motor boatmen throughout the country, is the construction of the canal connecting the St. Johns river with the North river. This undertaking has recently been completed by the Florida Coast Line and Transportation Company, and by connecting Jacksonville on the St. Johns with St. Augustine on the North river, by the way of Pablo creek, it practically marks the completion of the great undertaking that has resulted in the construction of a nearly continuous inland water way, along the entire Florida east coast to Key West.

It will probably be a year before the work is really completed, for the canal must be deepened where the dredges are working and there are many shoals to be cut and deepened in Pablo creek. Small craft, however, are already making the trip to and fro without the slightest difficulty.

Work upon the canal has been going on for over twenty years, although it was, of course, not continuous, and the great project when completed will have cost over $3,000,000. It will provide a through inland water way from Jacksonville to Key West and will be of immense value to the state alone through the additional number of pleasure craft that will take advantage of the safety offered by the inside route, to make the winter trip to Florida. When all the work on this link has been completed, the canal will probably be turned over to the state for inspection and approval. The company will then, in all probability, keep one dredge at work, maintaining the water ways all the way down the coast.

The cutting of this link between the North river and the St. Johns will not only be a great benefit to motor boating in general and to the state, but will greatly benefit both St. Augustine and Jacksonville, as it will make possible the carrying of freight and passengers by water between these two places, which has never been possible before without going around the coast and back up the St. Johns.

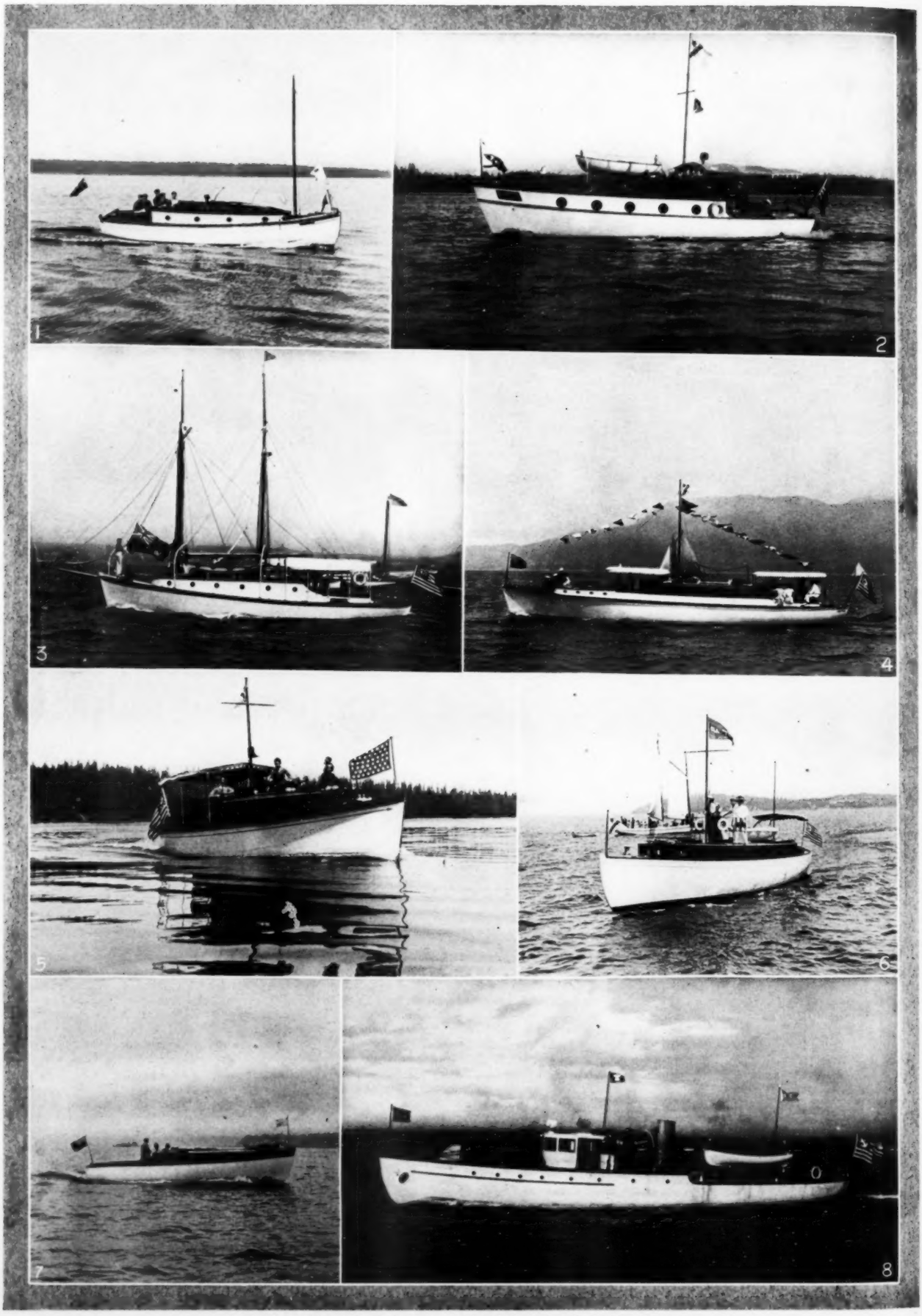
The officials of the Florida Coast Line Canal and Transportation Company have been giving the work their closest attention for many years and their efforts are at last soon to be rewarded by the final completion of an undertaking that when begun seemed almost impossible. It was generally regarded at that time as an absolute impossibility to make a success of the undertaking, but the merging of the waters of Pablo creek and the North river has been a sufficient answer to all doubt. This undertaking ranks with the greatest engineering enterprises that have been attempted on the entire Atlantic coast, and the canal will reflect great credit upon all who have taken a part in making it a success.

Captain Seth Perkins has been in charge of the active work of excavation and the illustrations herewith plainly show the results of his labor. The canal is being cut to a width of seventy feet and to a depth of six feet at mean low water, and five machines have been employed in tearing the earth from the line of the cut. Two excavators were employed in removing the surface earth along the line, thus preparing the way for the huge dredges, which digging the canals in which they floated worked toward each other, one from the north and one from the south.

Throughout this undertaking and the construction of other links of the same system, the motor boat has played a prominent part, facilitating as it has the work of inspection; and making it possible to keep in close touch with the various points of activity. The boats shown in the illustration on the opposite page and above were used by Captain Perkins and the other officials of the company and the latter was the first boat to make the trip through the canal after its opening.

Florida has long been a popular winter resort and the coming of the motor boat has greatly increased this popularity. The only drawback thus far has been that the trip from Jacksonville to Key West, which many of the visitors desired to take, was an outside trip and it was necessary either to wait for favorable weather or else run more or less risk of encountering storms upon the journey of over 400 miles down the coast. The completion of this canal not only furnishes an inland waterway, but also shortens the distance between the two places and furnishes a means of communication with towns which have not heretofore been upon a navigable waterway.

The phenomenal growth of motor boating within the past few years has given a fresh impetus to the improvement of water ways, activities upon which, though started many years ago, before the railroads became such a factor in transportation, have lain dormant until the last few years, and the United States government and the seaboard states and communities are now awaking to this new factor and just as the automobile has worked wonders in the improvement of highways throughout the country, we may expect that our inland water ways will undergo a wonderful development and improvement in the near future.



A number of boats well known on Puget Sound and the Pacific coast.

1—Talisman, a 32-footer of 9-foot beam, equipped with a 12-horse Rochester, owned by Robert Hadden, of the R. V. Y. C. 2—Mildred, one of the newer boats of the popular raised-deck type. 3—Wedgeon, one of the earlier trunk-cabin cruisers. 4—Soya, an interesting combination of the flush-deck and trunk-cabin types. 5—Zina, a type that has become popular on the Great Lakes and Pacific Coast. 6—Clansman, a 50-footer owned by Mrs. James Wood, of the Seattle Y. C., one of the first to finish in the Pacific International Long Distance Race. 7—Macumba, a 32-footer of the R. V. Y. C. 8—Davey Jones, built somewhat along the lines of a number of the eastern boats.

The Two Hundred Dollar Motor Boat.

The Second Instalment of the Series "How Much Does a Motor Boat Cost?" Boats Built or Bought for $200 or Less. The Engines for Them.

We come now to what can be had in a motor boat for $200 or less. Last month we took up those boats which can be bought or built for $100 or less and next month we shall see what the $300 boat is like; after that, the $400 boat, and so on throughout a year till we reach the $100,000 production.

Once again we would say, and we would place double emphasis on each word:

We want the owners of motor boats and we want the trade—the manufacturers of complete motor boats and the makers of engines—who read this note to send us at once descriptions and photographs of the boats they own or make or of the engines in their line, to be included in this series, and we want them to send us this material NOW.

Mr. Owner, send us a photograph and brief description of your boat and tell how you like her and why. Mr. Manufacturer, send us the data regarding your complete motor boats, or motors for use in this series. Next month we take up the $300 boat and motor. If your boat is in this class, send us a photograph and description immediately. Do it now!—EDITOR.

Bug—A Motor Canoe.

L. M. Watson, Boston, Mass.

WE are located on the Charles River, one of the greatest, and if the moon happens to be full, *the greatest* place for canoeing in the world, and we had paddled a canoe until we began to look with envy instead of scorn upon the occasional motor canoe; so, being a beautiful Sunday morning in the spring, and not realizing how rapidly a "bug" will grow, I said to the "Mrs.":

"How would you like to have a motor canoe for this summer?" She looked at me and smiled indulgently, very much as she might had I asked the same regarding a castle on the Rhine; but finally I had to take her up to the boat house where several motor canoes were kept and one was for sale.

A kind friend took us for a trip in his motor canoe and our "bug" began to take nourishment.

We learned of a motor canoe which could be bought for $125.00 and might have bought it if the owner hadn't seen us coming and raise me $25.

I knew that motor canoes had been built for $150 and I figured that by doing part of the work myself I could bring that down to $125, so I made a deal with C. P. Nutting & Co., than which there is no better concern on the river to do business with, and started in. Did I bring it down to $125? Not much. I took it up—up so close to $200 that you may keep the change. My friends told me I had a "bug" and I kept it up until I began to think I had. Now I know I have.

We took the regular 17 x 34 canvas paddling canoe, fitted an oak keelson and skeg, put on four foot decks, 1½ inch wash board and ¾ inch coaming, all in mahogany. We installed a two cylinder Waterman motor weighing about 65 pounds and rated at 5 h.p. at 1,000 r.p.m. and a Geyer reversible propeller, both of which have given excellent satisfaction.

The motor is placed in the rear end of the cockpit and the batteries and gasoline in the bow to counterbalance. The water is let into the exhaust pipe which is lead by means of steam hose to an expansion chamber under the after deck and thence to underwater exhaust just back of the propeller, an installation which has given perfect results.

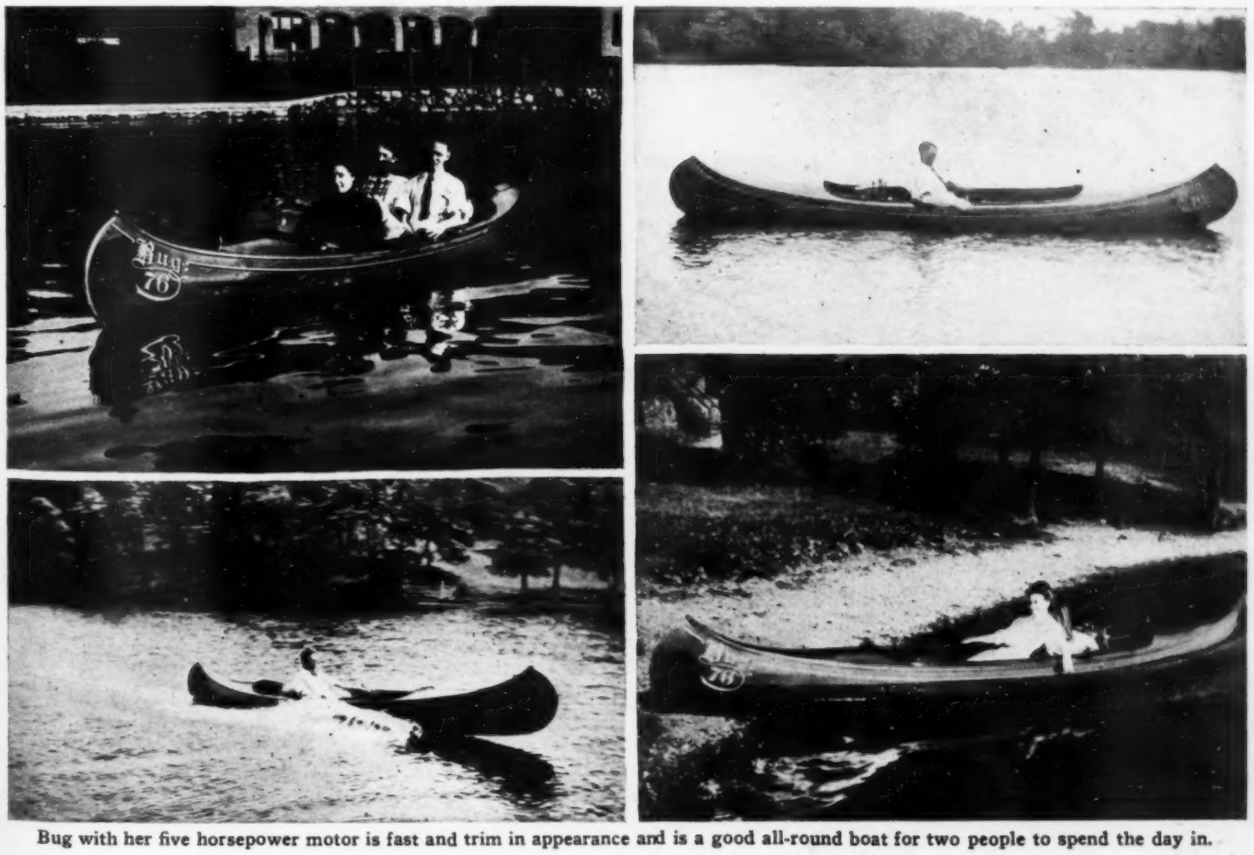
She is perfectly dry; she is remarkably comfortable for two to spend a day in; she is fast, close to 12 miles per hour; she is remarkably smooth and quiet running; she doesn't have to be painted and calked every year; she is neat, clean, light, smart in appearance; she is admired by my wife and her name is "Bug."

Zaza—A Converted Sail Boat

Eben Dow, Jr., Portland, Me.

MY brother and myself have been much interested in motor boats for a number of years, and always hoped to own one, but the cost seemed prohibitive for such a boat as we desired. We were always on the lookout for a trade, however, and so, last April, in scanning the ads of our local paper, we came upon this: "For sale, 20 foot Hampton boat, all ready for engine, $20." It seemed to be our opportunity. We investigated, went to look at the craft and found her to be one of those lap strake centerboard Hampton boats, so peculiar to Casco Bay, Maine. She was about twenty feet long, seven foot beam, and was originally a sailboat. Her owner had had an engine in her, but had removed it, leaving the engine bed all ready for another. It seemed rather a tough proposition to convert that old craft into a pleasure launch, but we decided to take a chance.

So we paid the twenty dollars, and towed her around to a boat builder, and he agreed to take out the centerboard, put in seats along the sides with lockers underneath, renail the planks, and put her in fair shape for fifteen dollars. So we made the bargain. In the meantime, we burned and scraped all the old paint off, and got her ready for the new dress.



Bug with her five horsepower motor is fast and trim in appearance and is a good all-round boat for two people to spend the day in.

Her timbers seemed to be in fair condition, and we concluded we had a good trade.

We were now ready for the engine. After much studying of catalogues, and advice from experts and near experts, we decided upon a Palmer 3½ horse, jump spark for motive power. The gasoline tank was installed under the thwart amidships, requiring only about

Zaza's 3½-horse Palmer drives her at a seven knot clip.

three feet of piping, while the batteries and coil were placed in a locker right alongside the engine, making the wiring a simple matter. We used two sets of six dry cells each, switching from one to the other every hour or so.

And one fine day we launched her. Well, she went fine at the very start, and continued all summer, the Palmer chugging away faithfully, and we made many pleasant trips down beautiful Casco Bay. We had to pump her out occasionally but she did not leak enough to bother us any. All told, including anchor, chain, and complete equipment, the boat stood us about $150, and we thought we had a pretty good boat for the money.

This winter we have added a coaming, new iron rudder, in place of the old wooden one, decked her over forward about four feet, put in lazy back seat in stern, brought engine control back to this seat, so with the steering wheel on our right hand, she is controlled very easily. We have also added new guard rail, and several other improvements. This work cost about $50, so the boat has cost us $200, completely equipped, and we get as much real pleasure with this old craft as we would with one costing twice as much.

The 3½ horse Palmer drives her about eight miles an hour. Her wide beam makes her an especially able sea boat, and if we were to build a new boat today we would build on this same model. These Hampton boats are built for hard service and Zaza is no exception to the rule.

Julia Ruth's little Atlantic.

16-Foot Dory-Skiff.

E. V. Lawrence, Bellevue, Pa.

JULIA RUTH is a motor dory-skiff 16 feet long with a 4 ft. 6 in. beam and was, when bought, equipped with a 1½ h.p., single cylinder, two cycle gasoline engine. The outfit was made by an eastern manufacturer (Atlantic Co.) and sold for $125.00.

In 1907-8 she ran over 1,500 miles with no cost for repairs, an alteration cost of $3.00 for a weedless wheel and a small cost for the annual painting. Eight cells were all that were used and some of them are on a telephone circuit now. The gasoline bill was about seven dollars and the oil cost just 50c.

During the winter of 1908-9 I made the engine over into a two cylinder by bolting the old engine down on to a new crankcase that I made, using a new shaft, cylinder and small parts, a feat declared impossible by gas engine men. The cost of the conversion was about $20.00, and I have increased the speed from 6 to 8 miles an hour at the same 500 r.p.m. I use a 12 inch weedless wheel as the river is full of grass, and the Orswell ignition system. The engine absolutely never misses.

I have made more or less change in the woodwork, such as substituting oak for pine and I now have a boat that will stand most any inland lake sea, carries 5 or 6 with comfort and jogs along at about eight miles through grass or not.

A V-Bottom 22-Footer.

Maurice E. Fuller, Kalamazoo, Mich.

CONCERNING the 22-foot speed boat, I bought the hull from a builder for $45 and installed the engine myself. It is of the V-shaped type, flattening out aft, very sharp at the bow and shaped much like a wedge. The boat was designed for choppy water and has a decided flare which keeps it

Last winter we made several changes.

dry. The engine, a single cylinder, two cycle, 8 horsepower, cost $145 and gives the boat a speed of 13 miles an hour, carrying two people. This boat will go anywhere in all sorts of weather wherever there is 28 inches of water, but is only suitable for two persons. One gallon of gasoline is good for about 6 miles.

A $200 Speed Boat.

Gerald T. White, New York City

THERE are several makes of 6 horsepower engines on the market that sell for less than $100 complete with boat and electrical equipment. This leaves $100 for the hull, excluding labor, which may be done by the amateur.

This hull is of the usual construction, framed with ½x¾ inch oak frames and planked with ½ inch white cedar or cypress, calked and painted. The fastenings are 2 inch copper nails in the planking and ¼ inch copper rod riveted over washers in the framing. The decks are of ¼ inch cedar or cypress, covered with canvas and painted; the coaming is a piece of ½ inch oak and the bulkhead, aft of the engine, and the seats are of the same material. The cockpit floor is ½ inch pine laid on oak frames 1½ x 1 inch and secured with 1 inch brass screws. The engine bed is 1½ inch spruce and is 10 feet long.

The hatch over the engine is in one piece

Zaza, a converted Hampton sail boat.

so as to lift off, and has a brass stack mounted on the center lines. This stack is for ventilating purposes, and the exhaust should be piped to the stern. The transom consists of 2 pieces of ½ inch oak finished bright.

An itemized list of lumber at the average market price is given below:

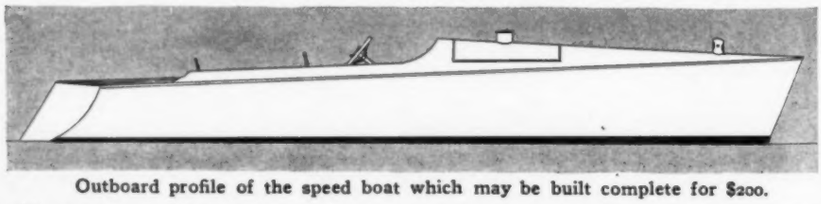
Keel, white oak, 11 sq. ft. at 13c	$1.43
Stem, oak knee	4.00
Transom, oak, 10 sq. ft. at 13c	1.30
Stern knees, three, of oak	3.00
Timbers, oak, 50 sq. ft. at 13c	6.50
Planking, cypress, 300 sq. ft. at 8c	24.00
Decking, cypress, 50 sq. ft. at 8c	4.00
Engine beds, spruce, 40 sq. ft. at 8c	3.20
Clamps, soft pine, 10 sq. ft. at 14c	1.40
Cockpit floor, pine, 25 sq. ft. at 10c	2.50
Deck and floor beams, oak, 10 sq. ft. at 13c.	1.30
Bulkheads and seats, oak, 25 sq. ft. at 13c.	3.25
Total for lumber	$56.88
Paint and varnish	$8.00
Fittings	10.00
Fastenings—nails, screws, etc	5.00
Tank and piping	15.00
Total	$94.88

In some localities lumber may be higher than given in the above figures, but the boat can easily be built for $200, including engine and full equipment, and should maintain a speed of 11 miles per hour, with a 6 horse-

Julia Ruth is a 16 ft. dory-skiff.

power high speed motor, weighing not over 175 pounds complete.

The dimensions of the boat, the profile of which is shown herewith, are length over all,



Outboard profile of the speed boat which may be built complete for $200.

22 feet, waterline length, 21 feet, beam, 4 feet, draft forward 9 inches; freeboard forward, 2½ feet; freeboard aft, 1½ feet.

Boats That Sell for Less Than $200.

The boats illustrated and described on this page are regular stock models that may be bought for less than $200, and we have endeavored to include herein all boats on the market that come within this figure. Next month we shall describe those selling for from $200 to $300, and the manufacturers of such boats are requested to send us at once photographs and descriptions of their product to insure their being inserted.—EDITOR.

Inland Lakes Runabouts.

INLAND LAKES BOAT COMPANY, Lake Geneva, Wis. In this class are the 16 and 18 footers. The former is 15 ft. 9 in. in length with a beam of 4 ft. 4 in., a seating capacity of 8 to 10 persons and a speed of 8½ to 9 miles per hour. The keel and frames are of oak and the planking is of cypress or cedar, fastened with copper or zinc boat nails. Equipped with 3 horse Ferro $150. The 18 ft. 9 in. model equipped with same engine sells for $200.

Niagara Knock-Down Boats.

NIAGARA MOTOR BOAT COMPANY, North Tonawanda, N. Y. The Niagara No. 40 is an 18 ft. launch of 4 ft. 7 in. beam, the depth at bow is 2 ft. 6 in., amidships 2 ft. and at the stern 1 ft. 3 in., the cockpit is 12 ft. long with a seating capacity of 6 persons. The materials from which to construct this boat complete sell for $100.

Emmons 17 Ft. Combination Dory.

E. GERRY EMMONS, Swampscott, Mass. This is a combination power and sailing dory equipped with the 1 horse Emmons motor. Frames, gunwales, stem and stern are of hard wood, the planking is of pine, the center board, rudder and fastenings are galvanized and the equipment includes one pair of oars and rowlocks. The 16, 17 and 18 ft. models sell for $125, $135 and $150, respectively. Illustration below.

DeFoe 18-Footer.

DEFOE BOAT AND MOTOR WORKS, Bay City, Mich. The boat shown in the illustration is 18 ft. in length x 51 in. beam, the frames and transom are of white oak and the planking is of ⅝ in. Louisiana red cypress. The seating capacity is 8 persons and the speed is 9 miles per hour. Equipped with a 3 horse, 3 port, 2 cycle motor of 3½ in. bore and 3 in. stroke, the price is $130. Illustration below.

24 Ft. Knock-Down Auto Craft.

THE CLEVELAND AUTO BOAT MANUFACTURING COMPANY, Cleveland, Ohio. This is the 24 ft. auto craft which may be had in any stage of completion. Materials for the hull, with the exception of the planking, sell for $62, with the planking for $84, and with decking, seats, coaming, etc., $105, with all the metal fixtures, including steering wheel, flagpole sockets, gasoline deck plate, tank and rudder the price is $125. Illustration below.

The Racine 15-Footer.

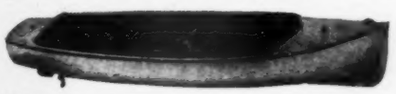
RACINE BOAT COMPANY, Racine, Wis. The little boat shown in the illustration is 15 ft. in length x 4 ft. 4 in. beam, the frames are of oak and the planking is of ⅛ in. Louisiana red cypress, and the deck is of white cypress laid in narrow strips. This boat with 2 horse power reversing motor complete and ready to run sells for $125. The hull alone may be had for $75. Illustration below.

Kennebec Motor Canoe.

KENNEBEC BOAT AND CANOE COMPANY, Waterville, Maine. The canoe shown herewith is of the popular canvas covered type, 18 ft. in length, 35½ in. in width and varying in depth from 13½ in. amidships to 27 in. at the ends. The price of this canoe equipped with 1½ horse motor is $150 and with 2 horse motor $160, with $15 additional for sponsons. Illustration below.

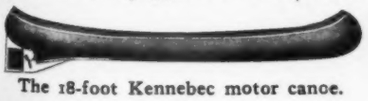
Emmons Combination Dory.

The DeFoe 18-footer has a speed of 9 miles.



Cleveland auto boats may be had in any stage.

15-foot Racine equipped with 2-horse motor.



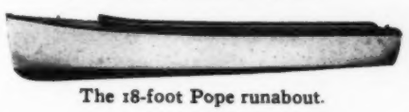
The 18-foot Kennebec motor canoe.

The Detroit special model A.

Cayuga equipped with 3-horse Ferro.

Seating arrangement of the 16-ft. Michigan.

Outing Sportsman's Special.



The 18-foot Pope runabout.

Moore 18-Footer.

MOORE BOAT WORKS, Wayzata, Lake Minnetonka, Minn. The smallest boat manufactured by this company is an 18 footer of 4 ft. 8 in. beam, with a capacity of 8 persons and speed of 7 miles per hour. The frame is of oak and the planking is of red cypress. It is equipped with a 2 horse power reversible motor and sells for $200 complete.

Three Detroit Models.

DETROIT BOAT COMPANY, Detroit, Mich. The three illustrations are of the Bluebird, the Lighthouse Special and the Special Model A. The Bluebird is 18 ft. long x 4 ft. 8 in. beam, seats 10 persons and with a 2 horse Detroit engine attains from 8½ to 9 miles; the price is $185. The Lighthouse Special is 14 ft. long x 4 ft. 2 in. beam, seats 7 persons and equipped with 2 horse Detroit motor sells for $125. The Detroit Special Model A is 18 ft. in length x 4 ft. 8 in. beam, seats 10 persons and equipped with 2 horse motor sells for $147. Illustration above.

The Cayuga 18 Ft. Special.

CAYUGA MOTOR BOAT COMPANY, Cayuga, New York. This boat, shown above, is 18 ft. in length, with 4 ft. beam and cockpit 12 ft. 5 in. in length. The frames, keel, etc., are of oak and the planking is ½ in. cedar. Fittings are polished brass, including 12 in. steering wheel, flagpole sockets, etc. Equipped with a 3 horse Ferro the price is $200.

The 16 Ft. Michigan Auto Boat.

THE MICHIGAN STEEL BOAT COMPANY, Detroit, Mich. This boat is 16 ft. in length x 4 ft. beam, and has a seating capacity of 8 to 10 persons. The engine is placed forward of the bulkhead, as shown in the illustration above. Equipped with 3 horse Detroit engine this boat sells for $130, and with a 5 to 6 horse Detroit engine the price is $160.

Robertson 16-Footer.

ROBERTSON BROS., Hamilton, Ont., Canada. This company builds and can supply knock-down frames for a number of small boats. Their 12 ft. power tender with 2½ horse power Guarantee motor sells for $140 complete. The 16 footer equipped with 2½ horse power engine sells for $180 complete and $200 with reversing propeller.

Outing Sportsman's Special.

OUTING BOAT COMPANY, Ashland, Wis. This boat is designed especially for the use of sportsmen and fishermen. The boat is equipped with a 3 horse Ferro Special motor which is concealed beneath the after deck. The 16 ft. model sells for $147.50, and the 18 ft. model, equipped with the same size motor, sells for $187.50. For salt water equipment $15 and $16.50, respectively. Illustration above.

18 Ft. Pope Runabout.

POPE BOAT COMPANY, Fondulac, Wis. The 18 footer shown is of 4 ft. 6 in. beam, the equipment consists of polished brass steering wheel and cleats, galvanized iron post and tiller line sheaves, rudder and quadrant. With 2 to 3 horse power reversing engine, bronze propeller and all boat and electrical fittings, ready to run, the price is $185. See above.

Brooks Knock-Down Boats.

BROOKS MFG. CO., 505 Ship St., Saginaw, Mich. Of the numerous models turned out by this company there are a number of motor boats and motor canoes which may be built and equipped with power for sums not in excess of $200. This company supplies patterns and knock-down frames so cut and fitted as to make the work of construction easily within the power of the amateur.

The Brein "Firefly" and "Nautilus."

THE BREIN MARINE WORKS, Rock Island, Ill. The Firefly is an 18 footer of 4 ft. 4 in. beam, built on speed boat lines with turtle deck and engine compartment forward. Equipped with a 4 horse power single cylinder engine the price is $158. The Nautilus is a 30 footer built on similar lines to the Firefly and sells for $177.

The Hand V-Bottom Racer.

WILLIAM H. HAND, Jr., Naval Architect, New Bedford, Mass. Mr. Hand's V-bottom racer is 15 ft. 8½ in. in length x 4 ft. beam and 10 in. draft. The complete plans, specifications and directions for building this boat may be had for $5, and the boat may be built and equipped with a 6 or 7 horse engine for a sum not in excess of $200. Mr. Hand also supplies materials or furnishes the completed boat.

The St. Louis Special.

ST. LOUIS BOAT AND ENGINE COMPANY, 3608-16 South Main Street, St. Louis, Mo. The 18 footer shown in the illustration has a beam of 4 ft. 4 in., cockpit 11 ft. 8 in. in length, a speed of 8 miles per hour and a seating capacity of 10 persons. The frames are of oak and the planking is of ⅛ in. Southern cypress. Equipped with a 3 horse power Ferro motor the boat sells for $150. See below.

The Edson Auto-Junior.

THE EDSON BOAT COMPANY, Skaneateles, N. Y. This boat is 16 ft. long with 4 ft. beam and 2 ft. depth amidships. Seating capacity is 6 persons and the speed equipped with 3 horse power Ferro is 8 to 9 miles per hour. The frame is of oak and the planking is of 7/16 in. cypress, fastened with galvanized iron nails, clinched over the ribs. Price $160.

Mullins 16 Footer.

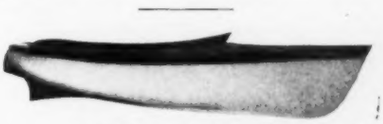
THE W. H. MULLINS COMPANY, Salem, Ohio. Heavy gage, galvanied steel is used in the construction of the Mullins boat. The keel, ribs and finish are of oak. This boat has a capacity of 8 persons and a speed of from 8½ to 9 miles per hour. It is equipped with a 3 horse Mullins reversible engine with Mullins under-water exhaust and sells complete for $110. Illustration below.

The Gile 18 Ft. Leader.

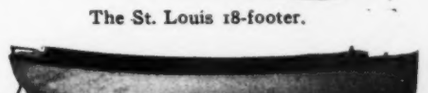
THE GILE BOAT AND ENGINE COMPANY, Ludington, Mich. The illustration shows the seating arrangement of the Gile Leader Launch, the dimensions of which are length 18 ft., beam 52 in., cockpit 10 ft. 4 in. Equipped with a 2½ horse, single cylinder Gile motor the speed is 6 miles and the price $129. With 4 horse, single cylinder the speed is 8 miles and price $154, and with 5 horse, double cylinder Gile, 10 miles is obtained and the price is $183.

Hyde Metal Hulls.

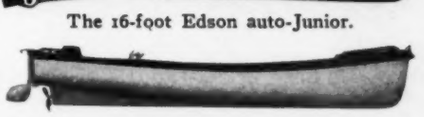
THE HYDE METAL BOAT COMPANY, Watertown, N. Y. The illustration shows one of the Hyde galvanized steel boats, constructed from the knock-down materials supplied by this company. There are but five pieces to the hull and these are so cut and punched as to reduce the work of assembling to a minimum. The 20 ft. boat is of 18 gage galvanized steel, weighs 450 pounds and sells for $65. The 24 and 28 ft. boats sell for $98 and $123, respectively.



The St. Louis 18-footer.

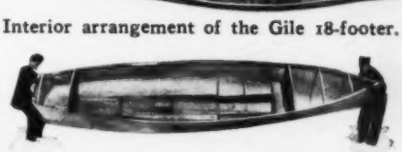


The 16-foot Edson auto-Junior.



The 16-foot Mullins pressed steel boat.

Interior arrangement of the Gile 18-footer.



One of Hyde metal knocked down hulls.

Motors for $200 Motor Boats.

This is the second installment of motors in the series "How Much Does a Motor Boat Cost?" In this installment we have included all those motors which might be used in a boat costing complete not over $200. We have taken $100 as the price limit for the motors themselves and have endeavored to include all motors not described in last month's issue and selling for less than this figure. Starting with the last issue this series will run through twelve issues and we shall take up, as we do here, all motors made coming within the various classes, including those for use in the largest cruisers. Manufacturers are requested to co-operate with us by supplying us with photographs, descriptions and net prices to retail purchasers of their various models for insertion in this series. In sending in this matter the manufacturer will incur no obligation of any sort, but will be conferring upon us a favor. We want this motor series to be representative of the entire trade and therefore of the greatest possible value to the motor boatman and prospective motor boatman.—EDITOR.

2 Horse Toppan Reversible.

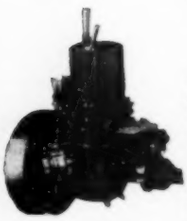
($85.00 *complete.*)

TOPPAN BOAT MANUFACTURING COMPANY, Boston, Mass. Two cycle, make and break ignition, two port, cylinder and head in one piece, will run on gasoline, alcohol or kerosene; reversible and get-at-able. Equipment includes float feed carbureter, shaft, stern bearing, propeller, brass pump, flexible coupling and all salt water fixtures. Used in Toppan dories and built for hard, continuous service.

The Emmons 2½ H. P.

(*With complete electrical and boat equipment,* $100.)

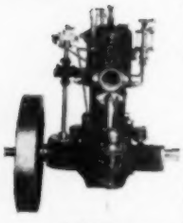
E. GARRY EMMONS, Swampscott, Mass. Two cycle, make and break ignition, 4 in. bore by 3½ in. stroke, diameter of fly wheel 14 in., diameter of propeller 15 in. x 16½ in. pitch, weight 110 lbs. The one horse Emmons is similar in construction and sells for $65 with complete equipment.



The Truscott 2 Horse.

($96.00 *complete.*)

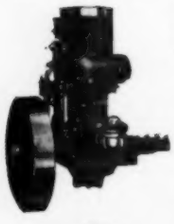
TRUSCOTT BOAT MANUFACTURING COMPANY, St. Joseph, Mich. Two cycle, make and brake ignition, size of base 7 x 11 in., height from center of shaft 15 in., center of shaft of bottom of crank case 3⅞ in., diameter of balance wheel 11¾ in., size of propeller 12 in., normal speed 675 r.p.m. weight 115 pounds. Equipment includes float-feed carbureter, spark coil, 2 sets of cells and all boat fittings.



5 H. P. Wisconsin Valveless.

(*Motor complete* $80.00. *With electrical and boat equipments* $95.00, $5.00 *extra for salt water fittings.*)

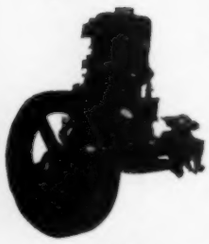
WISCONSIN MACHINERY AND MANUFACTURING COMPANY. Two cycle, jump spark ignition, counter-balanced crank shaft, reducing vibration. Equipment includes Schebler carbureter, Connecticut or reversible timer, spark plug, water pump, oiler, priming and relief cocks, wrenches, etc. The speed range is from 200 to 1400 r.p.m.



3 H. P. Mianus.

(*Engine complete* $85.00; *with electrical and propeller outfit* $100.00.)

THE MIANUS MOTOR WORKS, Mianus, Conn. Two cycle, make and brake ignition, reversible, bore 4 in., stroke 4 in., speed 550 r.p.m., height from center of shaft 15⅜ in., diameter of balance wheel 14 in., speed controlled by throttle lever, removable cylinder head.



Loveland, 3 H. P.

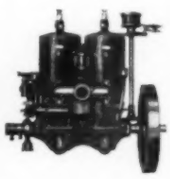
(*Engine complete* $55.00.)

LOVELAND MANUFACTURING COMPANY, 17 Atlantic Street, Bridgeton, N. J. Two cycle, valveless, reversible, water proof sparking system, 4 in. bore by 3½ in stroke.

2½ Horse Royal.

($75.00 *complete.*)

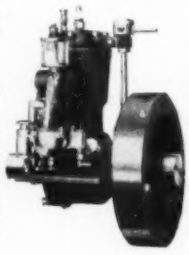
THE ROYAL ENGINE COMPANY, Bridgeport, Conn. Two cycle, make and break ignition, size of bed plate 10¾x10¾ in., from center of shaft to top of cylinder 17½ in., from center of shaft to bottom of crank case 4¾ in., diameter of flywheel 11½ in., diameter of crank shaft 1 in., diameter of propeller shaft ¾ in., distance between supporting timbers, 8¾ in.



4-5 H. P. Waterman, K-2.

(*Engine only* $72.00; *with regular marine equipment* $100.)

THE WATERMAN MARINE MOTOR COMPANY, 1506-12 Fort Street West, Detroit, Mich. Two cylinder 2 cycle, jump spark ignition, bore 2¾ in., stroke 3 in., normal speed 800 r.p.m., net weight 90 pounds. The regular marine equipment includes all electrical and boat fittings ready to install in the boat.



3 H. P. Ferro.

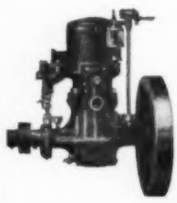
(*Engine complete* $60.00; *equipped for fresh water* $100.00; *for salt water* $3.00 *extra.*)

FERRO MACHINE & FOUNDRY CO., Cleveland, O. Two cycle, jump spark ignition, 3⅜ in. bore, 3¼ in. stroke, diameter of fly wheel 13 in., diameter of crank shaft 15/16 in., diameter of propeller shaft ¾ in., normal speed from 700-900 r.p.m. This is the Ferro Special, and is similar in most respects to the regular Ferro line.

The Liberty, 1½ H. P.

(*Motor only* $53.00; *with complete equipment* $71.50; $5.00 *additional for salt water fittings.*)

DETROIT AUTO SPECIALTY COMPANY, 909-11 Greenwood Avenue, Detroit, Mich. Two cycle, jump spark ignition, bore 4 in., stroke 3½ in., diameter of crank shaft 1¼ in., normal speed 800 r.p.m, weight 130 pounds. This company also manufactures two other sizes which come within this class, viz., a 2½ horse power at $65.50 and a 3½ horse power at $76.50.



3½-4 H. P. Perfection.

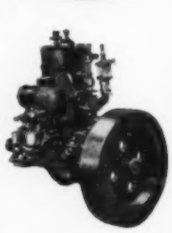
(*Engine complete* $60.00; *with electrical and boat equipment* $68.00; *salt water equipment* $3.00 *extra.*)

CAILLE PERFECTION MOTOR COMPANY, Detroit, Mich. Two cycle, make and break ignition, bore 3⅞ in., stroke 3½ in., height from center of shaft 13¾ in., bottom of crank case to center of shaft 3½ in., diameter of fly wheel 14 in., weight 150 pounds, speed from 100 to 800 r.p.m.

Brown-Talbot, 4 H. P.

(*Engine and outfit* $75.00.)

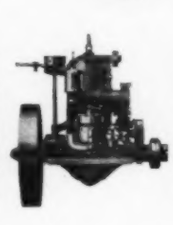
THE BROWN-TALBOT MACHINERY COMPANY, Salem, Mass. Two cycle, make and break ignition, bore 4 in., stroke 4 in., speed 600 r.p.m., weight 200 pounds. Outfit includes engine, carbureter, pump, speed controller, sight feed oiler, grease cups, priming cups, drain cock, ball thrust bearing, coupling, etc.



2½ H. P. Stanley.

(*Motor complete with water cooled exhaust* $72.00; *with complete electrical and boat equipment for salt water* $95.17.)

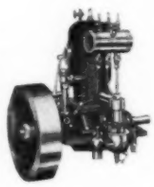
THE STANLEY COMPANY, 79 Milk Street, Boston, Mass. Two cycle, make and brake ignition, reversible, bore 4 in. stroke 3½ in., normal speed 500 r.p.m., weight 175 pounds, diameter of fly wheel 14½ in., drives two-bladed propeller 15 in. diameter and 16½ in. pitch.



The 3 H. P. Vim Special.

(*Motor with complete equipment except muffler, gasoline tank and piping* $78.50; *for salt water* $82.50.)

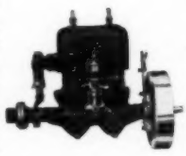
THE VIM MOTOR MANUFACTURING COMPANY, Sandusky, Ohio. Two cycle, jump spark ignition, bore 3½ in., stroke 3½ in., height from center of shaft 12 in., diameter of fly wheel 12 in., normal speed 800 r.p.m., weight 100 pounds. The 5 h. p. Vim is similar in appearance to the Special just described. It sells for $100 with $5 additional for salt water equipment.



Springfield, 3 H. P.

(*Engine complete with electrical equipment* $75.00; *with boat equipment* $92.25.)

THE SPRINGFIELD MOTOR COMPANY, Springfield, Mass. Two cycle, jump spark ignition, bore 4 in., stroke 4 in., normal speed 550 r.p.m., weight 160 pounds, height from center of crank shaft 15 in., depth from center of crank shaft 3½ in., diameter of balance wheel 13 in.



Lockwood-Ash, 5-6 H. P.

(*Engine* $80.00; *engine complete* $89.00; *with electrical equipment* $100.00.)

LOCKWOOD-ASH MOTOR COMPANY, Jackson, Mich. Two cylinder, two cycle, jump spark ignition, 3¼ in. bore by 3½ in. stroke, height from center of shaft 13 in., diameter of fly wheel 11½ in., diameter of crank shaft 1⅛ in., weight 150 pounds, speed 200 to 1000 r.p.m.

The Tuttle 2 Horse.

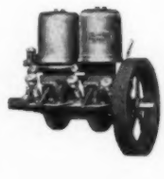
($46.50 *stripped,* $66.75 *completely equipped.*)

D. M. TUTTLE COMPANY, 54 Holden Street, Canastota, N. Y. Bore 3¼ in., stroke 3 in., diameter of crank shaft 1¼ in., diameter of balance wheel 11 in., diameter of propeller shaft ⅝ in., diameter of propeller 10 in., exhaust 1¼ in. pipe, width of base 9⅜ in., length of base 5¾ in., distance from center of shaft to top of cylinder, 12 in., distance from center of shaft to bottom of crank case 3¼ in., distance between bed timbers 6¼ in., weight 70 pounds, normal speed 900 r.p.m.

3 H. P. Ontario.

(*Complete motor with electrical equipment* $86.00; *with propeller equipment* $94.00; *with reversible propeller* $100.00.)

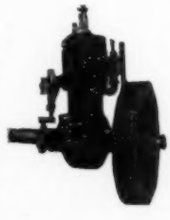
ONTARIO IRON WORKS, Pulaski, New York. Two cycle, three port, valveless, bore 3½ in., stroke 3½ in., normal r.p.m. 900, weight complete 123 pounds, diameter of shaft 1¼ in., length of base 6½ in., width of base 12 in., diameter of fly wheel 13 in.



6 H. P. Watkins Special.

(*Motor* $90.00; *complete with boat and electrical equipment* $125.00.

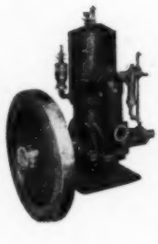
THE WATKINS MOTOR COMPANY, 523-529 Bay Miller Street, Cincinnati, Ohio. Two cylinder, two cycle, three port, jump spark ignition, bore 3 in., stroke 3 in., aluminum base and copper water jacket, bringing weight down to 50 pounds. The 3 h. p. single cylinder sells for $65.00 complete.



The Humming Bird 1½ H. P.

($65.00 *complete.*)

ALEXANDER & CO., 67 West Monroe Street, Chicago, Ill. Two cycle, bore 3⅛ in., stroke 3 in., center of shaft to bottom of base 3 5/16 in., center of shaft to top of cylinder 12 in., diameter of flywheel 12½ in., length 17 in., width 9 in., size of bed plate 9x7¾ in., weight 80 pounds, jump spark ignition, normal speed 699 r.p.m. The equipment consists of carbureter, spark coil, battery, plugs, oilers, grease cups and wire.



6 H. P. Peerless.

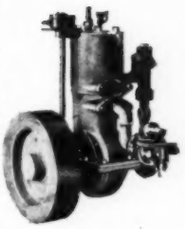
(*Bare engine* $80.00; *with complete equipment* $100.00.)

SIBLEY-HOUFLEY MACHINE COMPANY, Detroit, Mich. Two cycle, jump spark ignition, bore 4¾ in., stroke 5 in., diameter of crank shaft 1¾ in., turns an 18 in. 3 blade propeller of 23 in. pitch from 500 to 600 r.p.m., weight 250 pounds, water jacketed exhaust pipe.

The M. A. F. Co. 3 H. P.

($58.00 *complete.*)

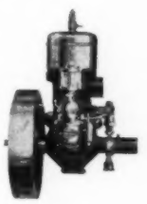
THE ROME GASOLINE ENGINE COMPANY, Rome, N. Y. Two cycle, jump spark ignition, 3⅛ in. bore by 3¼ in. stroke, weight 125 pounds, diameter of crank shaft 1⅞ in., diameter of fly wheel 13 in., diameter of propeller 14 in., propeller shaft ¾ in., speed from 200 to 1200 r.p.m. Bearings on crank shaft and connecting rod are interchangeable and can be replaced.



3 H. P. Thrall Refined.

($60.00 *complete.*)

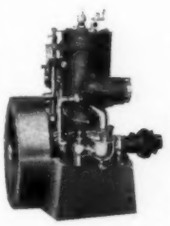
THRALL MOTOR COMPANY, 2-38 21st Street, Detroit, Mich. Two cycle, jump spark ignition, 3½ inch bore by 3½ stroke, weight 60 pounds, copper water jackets reducing weight and adding to appearance. The equipment includes all boat and electrical fittings and a reverse gear will be supplied for $15.00 extra.



The Bridgeport 2½ H. P.

(*Price of motor equipped with carbureter $90.00; for bronze shaft, propeller and stuffing box $10.18 extra.*)

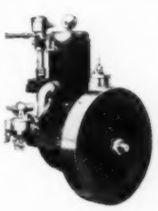
THE BRIDGEPORT MOTOR COMPANY, INC., Bridgeport, Conn. Two cycle, jump spark ignition, bore 3⅜ in., stroke 4 in., normal speed 500 r.p.m. The motor equipment includes muffler, circulating pump spark plug, gasolene supply cock, oil cups, grease cups, wrenches, oil cans, oil and grease. This motor is of the medium speed type.



Lackawanna, 2½ H. P.

(*Complete engine* $75.00; *with ignition equipment* $84.75; *with complete boat outfit,* $91.35.)

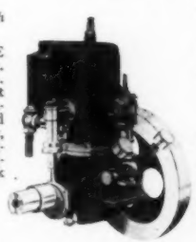
LACKAWANNA MFG. COMPANY, Newburg, N. Y. Two cycle, reversible, valveless. Bore 3 in., stroke 3 in., normal speed from 700 to 950 r.p.m., approximate weight, 75 pounds. Height from center of shaft 11⅞ in., diameter of balance wheel 12 in.



2½ H. P. Gile.

($55.00 *complete; $60.00 with salt water equipment.*)

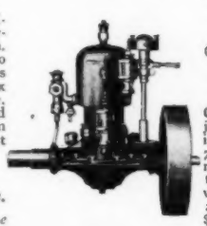
GILE BOAT & ENGINE COMPANY, Ludington, Mich. Two cycle, jump spark ignition. Normal speed 900 r.p.m., weight 85 pounds. The equipment includes an automatic float feed carbureter, lubricator, shafting, bronze propeller, brass stuffing-box, sea cocks and outboard exhaust head, together with spark plug, coil, battery, switch, etc.



2½-3½ H. P. Capital.

($90.00 *complete.*)

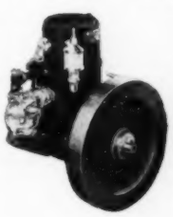
FIFIELD BROTHERS COMPANY, Augusta, Me. Two cycle, jump spark ignition, 3½ in. bore, 3¼ in. stroke, weight 100 pounds. The equipment includes either the Orswell or the Perfex ignition system, plug, coil, cable, five dry cells, Holley float feed carbureter, muffler or expansion chamber for underwater exhaust and all salt water fittings.



The 4-5 H. P. Belle Isle.

(*Bare engine* $40.00; *complete engine* $52.00; *with accessories and fresh water boat fittings* $69.00; $4.00 *extra for salt water fittings.*)

THE NEW BELLE ISLE MOTOR COMPANY, INC., Park View and Jefferson E., Detroit, Mich. Two cycle, jump spark ignition, bore 4¼ in., stroke 3¾ in., normal speed 700 r.p.m., height from center of crank shaft 13½ in. The 5-6 horse Belle Isle, complete with salt water boat fittings sells for $98.00.



3 H. P. Atlantic.

($100.00 *complete.*)

THE ATLANTIC COMPANY, Amesbury, Mass. Two cycle, 3 port, jump spark ignition, cylinder dimensions 3⅜ x 3¼ in., from center of shaft 13¼ in., diameter of balance wheel 13 in. Weight 85 pounds, normal speed 600 r.p.m. Equipment includes Schebler or other high grade carbureter, muffler, propeller and shaft and all electrical equipment.

3 H. P. Hartford.

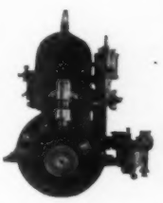
(*Engine complete* $83.00; *with boat and electrical equipment* $100.00.)

THE GRAY AND PRIOR MACHINE COMPANY, Hartford, Conn. Two cycle, reversible, make and brake ignition, bore 4 in., stroke 4½ in., normal speed 500 r.p.m., net weight 190 pounds, propeller 17 in. diameter by 24 in. pitch, height from center of shaft 18¾ in., diameter of fly wheel 14 in.

Miss Simplicity 3 H. P.

($70.00 *complete,* $4.00 *extra for salt water fittings.*)

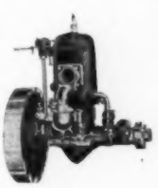
ST. JOSEPH MOTOR COMPANY, St. Joseph, Mich. Two cycle, jump spark ignition, reversible. Bore 3¾ in., stroke 3½ in., normal speed 800 r.p.m., weight 115 pounds, height from center of shaft 13¼ in., diameter of balance wheel 12 in. Price includes float feed carbureter and complete boat and electrical equipment.



3½ H. P. Fairbanks-Morse.

(*Engine complete* $62.00; *with boat and electrical equipment* $81.50.)

FAIRBANKS - MORSE & COMPANY. Two cycle, 3 port, jump spark ignition, bore 3¾ in., stroke 3¾ in., speed 800 r.p.m., weight 144 pounds. Equipment includes rotary circulating pump, float feed carbureter, ball thrust bearing, muffler, etc., together with 6 feet of steel shafting, 2 blade 14 in. bronze propeller and electrical equipment.



The T. & M. 2 H. P.

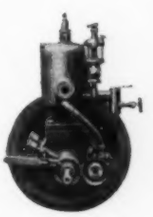
($86.00 *complete;* $90.00 *equipped for salt water.*)

TERMAAT & MONOHAN COMPANY, Oshkosh, Wis. Two cycle, jump spark ignition, reversible. Equipment includes spark plugs, wire, switch, coil, batteries, shaft, polished bronze speed propeller, stuffing-box, wrenches, etc. A complete line of the T. & M. marine motors is carried in stock by the Toppan Company of Boston and New York.

The Wright, 3-3½ H. P.

(*With boat and electrical equipment* $75.00; *for salt water fittings* $6.50 *extra.*)

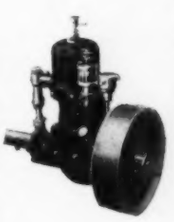
THE WRIGHT MOTOR COMPANY, 48 South Division Street, Buffalo, New York. Two cycle, 3 port valveless, jump spark ignition, bore 3½ in., stroke 3½ in., speed 100 to 900 r.p.m., weight 96 pounds, diameter of crank shaft 1¼ in., diameter of fly wheel 14 in., width between supports 7 in.



The Palmer, 3 H. P.

(*Motor complete* $70.00; *with electrical and boat equipment* $85.00.)

PALMER BROS., Cos Cob, Conn. Two cycle, three port, jump spark ignition, bore 3¼ in., stroke 3½ in., normal speed 700 r.p.m. This company also manufactures a motor with detachable sparker which comes within this class. It is rated at 2 horse power and sells for $87.00 with electrical and boat equipment.



The 3 H. P. Pierce.

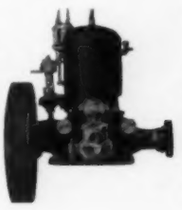
(*Complete with electrical and boat equipment* $66.00)

PIERCE MOTOR COMPANY, Racine, Wis. Two cycle, jump spark ignition, reversible. Bore 4 in., stroke 4 in., normal speed 600 r.p.m., weight 65 pounds, diameter of crank shaft 1½ in., diameter of propeller shaft ⅞ in. The 4 horse Pierce sells for $80.00.

The 6 H. P. Gray.

(*Complete outfit for fresh water* $94.00; *for salt water* $100.00.)

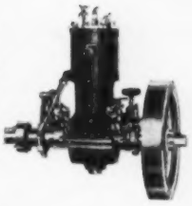
GRAY MOTOR COMPANY, Detroit, Mich. Two cycle, jump spark ignition, bore 4½ in., stroke 4 in., normal speed 700 r.p.m., weight 200 pounds. The Gray 3 horse and the 4 horse models also come within this class, selling for $67.50 and $78.00, respectively, equipped for fresh water.



3 H. P. Watertown.

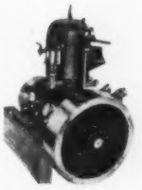
(*Complete with boat and electrical equipment* $100.00.)

WATERTOWN MOTOR COMPANY, Watertown, N. Y. Two cycle, jump spark ignition, bore 3½ in., stroke 3½ in., height above center of shaft 13½ in., diameter of fly wheel 13¼ in., 6½ in. between supports, normal speed 750 r.p.m., weight 100 pounds.



The Universal, 3½ H. P.

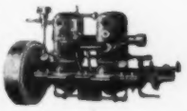
WEST MYSTIC MANUFACTURING COMPANY, West Mystic, Conn. Two cycle, jump spark ignition, 3½ in. bore by 3½ in. stroke, normal speed 800 r.p.m., weight 160 pounds, height from center of shaft 13 in., diameter of fly wheel 13 in., distance between supports 7¾ in.



The 3 H. P. Victor.

(*Motor alone* $48.50; *complete with electrical and boat fittings* $73.00; *with bronze salt water fittings* $84.50.)

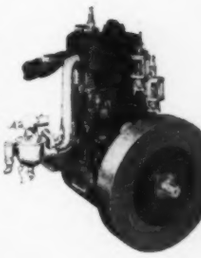
ROBERT S. HILL, 24 East Woodbridge Street, Detroit, Mich. Two cycle, jump spark ignition, reversible, bore 4 in., stroke 3½ in., drives 14 in. propeller 750 r.p.m., weight 100 pounds. The Victor 3 horse double cylinder sells for $77.00 and $92.00 complete with $10.00 additional for salt water fittings.



3 H. P. Regal.

(*Engine complete with electrical equipment* $99.00.)

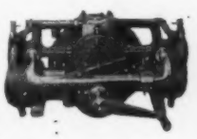
REGAL GASOLINE ENGINE COMPANY, Coldwater, Mich. Four cycle, jump spark ignition, mechanical valves. Bore 4 in., stroke 4½ in., diameter of crank shaft 1¼ in., diameter of balance wheel 14 in., speed from 150 to 600 r.p.m., weight 225 pounds.



The 2 H. P. Hall.

(*Engine complete* $60.00; *with boat and electrical equipment* $100.00; $4.75 *extra for salt water fittings.*)

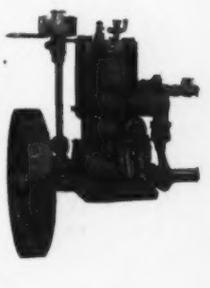
HALL GAS ENGINE MANUFACTURING COMPANY, Byesville, Ohio. Two cylinder, horizontal opposed, four cycle, bore 2¼ in., stroke 2 in., weight 50 pounds. Extreme width 21 in., diameter of fly wheel 8 in. The price above includes reverse gear and without this the outfit may be had for $80.00.



5 H. P. Wonder.

(*Engine complete* $75.00.)

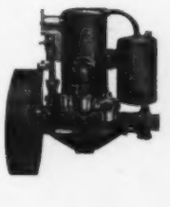
THE WONDER MANUFACTURING COMPANY, 258 Tallman Street, Syracuse, N. Y. Reversible, 2 cycle, jump spark ignition, weight 100 pounds. Equipment includes Schebler carbureter, Crouse Hinds timer, muffler and plunger pump. Will drive an 18 to 20 foot boat 8 to 10 miles per hour, according to the design of the boat.



2½ H. P. Fulton.

(*Engine complete with make-and-brake ignition* $90.00; *with jump spark ignition* $83.00; *with electrical and boat equipment the prices are* $110.75 *and* $112.25.)

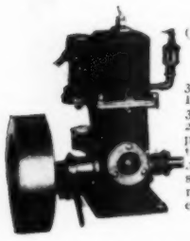
FULTON ENGINE COMPANY, Erie, Pa. Two cycle, make-and-brake or jump spark ignition, bore 3½ in., stroke 4 in., normal speed 650 r.p.m., net weight 160 pounds, diameter of propeller shaft ⅜ in., propeller 14 in. in diameter by 20 in. pitch.



The 4 H. P. Skipper.

(*Engine complete* $43.50; *with electrical and boat equipment* $45.00; $5.00 *additional for salt water fittings.*)

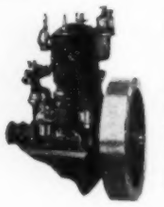
MONARCH TOOL AND ENGINE COMPANY, 16 Opera Place, Cincinnati, Ohio. Two cycle, jump spark ignition, bore 4¼ in., stroke 3¼ in., diameter of crank shaft 1¼ in., diameter of fly wheel 13 in., normal speed 700 r.p.m., weight 110 pounds, 2 bladed propeller 14 in. in diameter.



2½-3 H. P. Shortt.

($100.00 complete with electrical equipment.)

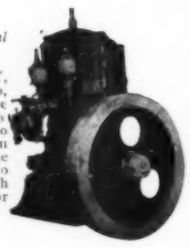
W. M. RYAN COMPANY, 314 South Canal Street, Chicago, Ill. Jump spark ignition, bore 3 in., stroke 3 in., speed range 200 to 1200 r.p.m., weight 110 pounds. An original feature in the construction of this engine makes it possible thoroughly to scavenge the cylinder although receiving a power impulse for every revolution.



2½ H. P. Anderson.

(With complete electrical and boat equipment, including reversible propeller, $90.00.)

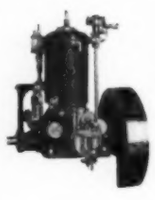
ANDERSON ENGINE COMPANY, Shelbyville, Ill. Four cycle, jump spark ignition, bore 4 in., stroke 4 in., normal speed 600 r.p.m., weight 175 pounds, diameter of fly wheel 15 in., fuel consumption under full load 1 gallon per horse power in 10 hours.



The 4 H. P. Detroit.

(Engine only $42.50; with electrical and boat equipment for salt water $98.90.)

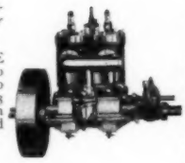
DETROIT ENGINE WORKS, Detroit, Mich. Two cycle, jump spark ignition, 50 to 1000 r.p.m. The 2½ and 3 horse models also come within this class, selling for $33.00 and $37.50, respectively.



6 H. P. Toledo.

(Engine complete with electrical equipment $80.00; with propeller equipment $84.00; $4.50 extra for salt water fittings.)

THE UNIVERSAL MACHINE COMPANY, Toledo, Ohio. Two cycle, jump spark ignition, 4½ in. bore, 4½ in. stroke, diameter of crank shaft 1½ in., diameter of propeller shaft 1 in., weight with equipment 185 pounds, diameter of fly wheel 14 in. The James Improved Carbureter may be had instead of the regular generator valve for $4.00 extra.



The Brownie Canoe Engines.

(Complete with electrical and boat equipment $85.00.)

THE B. F. BROWN GAS ENGINE COMPANY, Syracuse, New York. Two cycle, jump spark ignition, 2¼ in. stroke, 2¼ in. bore, regularly equipped with aluminum base this motor weighs but 35 pounds. The 1½ horse also comes within this class, selling with complete equipment for $95.00.

1½ H. P. Eagle.

(Complete with equipment $75.)

THE PROGRESSIVE MANUFACTURING COMPANY, INC., Torrington, Conn. Two cye, make-and-brake ignition, bore 3 in., stroke 3 in., normal speed 700 r.p.m., crank shaft 1 1/16 in., weight 85 pounds. The 3½ horse, model B and the 2½ horse, Model F sell for $90.00 and $85.00, respectively.

Precautions Against Fire on Motor Boats

A CIRCULAR has recently been issued by the Marine Department of the British Board of Trade, containing some useful advice on the subject of obviating accidents from fire and explosion on motor boats, and as this advice applies equally well to conditions on this side of the Atlantic, we are running it herewith.

The motor, if placed below deck, should be isolated by being enclosed within a separate well-ventilated compartment. This compartment should be furnished with at least two cowl ventilators, one of which should be carried down to the lower part of the space.

It is preferable for the motor in an open launch to be situated aft, but in any case a watertight bulkhead or bulkheads should be fitted so as to prevent any gasoline or oil which may leak from the motor getting access to the space in which people or stores are carried.

The gasoline tank should be large enough to obviate the necessity for carrying a supply of gasoline in spare cans; but if this is impossible, the spare cans should be strong enough to stand rough handling without leaking, and should be stowed so that they cannot be moved or become damaged by the motion of the vessel. They should be kept in a suitable metal receptacle in an open place and well ventilated.

The gasoline tank should also be substautially made and oil-tight, and so arranged that no gasoline which may be spilled in filling it will drop into the vessel below deck.

A wire gauze diaphragm should be fitted to each outlet and inlet of the tank, and the open end of the inlet should be led to an open situation on deck, as the air and gas displaced when filling the tank may be an explosive mixture.

It is of the greatest importance that all the fittings should be kept perfectly tight in order that no gasoline or gas may escape.

All exhaust pipes should be efficiently cooled.

The usual means for extinguishing fire from gasoline should be carried, such as a supply of sand and one or more efficient chemical fire extinguishers, and a notice should be placed in a conspicuous position, warning the occupants of the danger which might arise from smoking, striking matches, or carrying a naked light in the engine room, or near the gasoline when the tank is being replenished.

The Prize Contest *in* Questions and Answers

ON pages 39, 40, 41 and 42 appear the answers to the questions which were printed in the April issue of MOTOR BOATING. The installation of an under-water exhaust, what defects to look for in a used boat and the advantages of flare are all considered and thoroughly treated. It is everybody's contest—come in.

IN regard to the prizes: As there has been some difficulty in determining what a number of the prize winners would like as prizes, resulting in unnecessary labor and delay, we must insist that each contestant when he sends in his answer state definitely what he would like in the event of his winning a prize. And we must insist also that he select some one thing whose advertised price is either $5.00 or $25.00 and not a collection of different articles whose combined prices are equal to the above figures, excepting, of course, those articles which may be had in quantities of a dozen, half dozen, etc., such as spark plugs, dry cells and the like.

READ the general conditions again: We will give prizes to those who send in the best answers to the questions printed herein each month, and in order that the contest may be helpful to the greatest possible extent, we will give prizes for the best and most practical questions submitted for the next following competition. There will be three questions in the contest each month, and therefore three prizes for the answers.

THE QUESTIONS FOR THE AUGUST CONTEST ARE THESE:

In case of a disabled steering gear, what is the best method of rigging a jury rudder on a motor boat? (Sketches are desirable.)

Suggested by Allan O. Goold, Portland, Me.

Is it good practice to lubricate two cycle motors by putting the oil into the gasoline?

Suggested by J. F. Shaid, Rochester, N. Y.

Suggest a novel and striking event or competition for the program of a water carnival or club regatta.

NOTE.—The last question, printed originally in the July issue of last year and answered in the August issue, brought in so many good suggestions that it was decided to run it again in this issue so that those who have tried, heard of or thought of interesting "stunts" in the meantime, might have another opportunity of passing their suggestions along.

Answers to these questions, addressed to the Editor of MOTOR BOATING, 1789 Broadway, New York, must be:

(*a*) In our hands on or before June 28th, (*b*) not over 500 words long, (*c*) written on one side of the paper only, (*d*) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired).

Questions for the next contest should reach us on or before the 28th of June.

THE PRIZES ARE:

For each of the best answers to the questions above, *any article* advertised in MOTOR BOATING, of which the advertised price does not exceed $25, or a credit of $25 on *any article* advertised in MOTOR BOATING, which sells for more than that amount.

(*There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.*)

For each of the questions selected for use in the next contest, *any article* advertised in MOTOR BOATING, of which the advertised price does not exceed $5, or a credit of $5 on *any article* advertised in MOTOR BOATING, which sells for more than that amount.

For all non-prize-winning answers published we will pay space rates.

When you send in your answer state what you will take if you win the prize.

Installing an Under-Water Exhaust.

A Number of Suggestions and Diagrams for the Solution of the Exhaust Problem. Systems Which if Properly Installed Should Effectually Reduce Noise.

THE PRIZE CONTEST—Answers to the First Question in the April Issue.

A Successful Installation.

The Prize Winning Answer.

THE trouble experienced from an under-water exhaust is almost invariably due to improper installation. In order to be sure that the instructions which I shall give will enable anyone to install an under-water exhaust properly, I am going to tell how to install it exactly as I have seen it done in three different open boats, all of which run faster with the engine exhausting under water than when exhausting into the atmosphere.

As the question does not specify any certain type of open boat, I shall use, in my explanation, one of about the average type. I shall assume that the engine is placed about amidship, and that there are seats extending from the engine to the after deck.

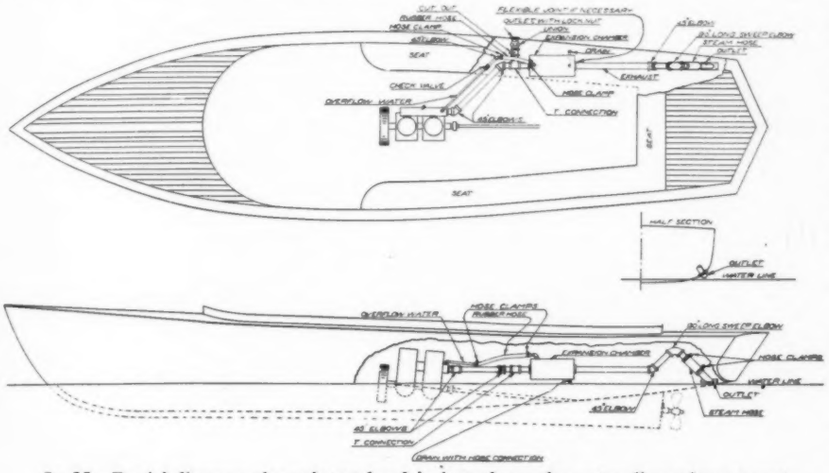
As will be seen from the drawing, the exhaust pipe is turned under the seat by using forty-five degree elbows. There it is connected to the cutout, and to the expansion chamber by a T connection. The cutout is connected to the outlet by a union. The cut-out may be omitted, but by its use the operator may test his engine for regular firing when the boat is under way.

The expansion chamber should be large enough to allow proper expansion of the exhaust gases. About seven times the volume of the engine cylinder is considered about right. The lowest part of the expansion chamber should be about four inches above the water-line so that it will drain properly.

The overflow water is piped into the top of the expansion chamber, a check valve being placed in the line to prevent the water from being blown back into the engine. A drain, which discharges just above the water-line, is placed at the lowest part of the expansion chamber. Both of the water connections are made with rubber hose secured by clamps.

The exhaust pipe, from the expansion chamber to the under-water outlet, makes an upward bend just before reaching the outlet. This bend is made by using a forty-five degree elbow, and a ninety degree long sweep elbow. A piece of steam hose secured by clamps makes connections to the outlet much easier, and prevents vibration. The object of the upward bend is to prevent water from entering the exhaust pipe through the outlet.

An under-water exhaust outlet in which the gases are forced out by a stream of water is best, but other types may be used satisfactorily. The outlet should be placed just above the waterline when the boat is not in motion. It should be placed well aft, behind the propeller if possible. When the boat is under way, the outlet will be submerged, and when backing up or when the engine is running idle, the outlet will be free. The half section in the drawing shows the position of the outlet.



In Mr. Davis' diagram the exhaust head is just above the water line when at rest.

In conclusion, follow the above instructions and you will have a noiseless, odorless boat, and vibration will be greatly reduced.

A. C. DAVIS, JR., Ithaca, New York.

Exhaust Forward of Stern.

IT were well at the beginning to realize that single cylinders and slow speeds will not exhaust under water as easily as multiple cylinders and high speeds, and that to a certain extent the heat and noise are proportional. By expanding the gases in the muffler their temperature is reduced, and by introducing the circulating water into the muffler a large portion of the heat is absorbed. There must be, however, sufficient water to condense any steam which may be formed, otherwise there will be a "pound" at the exhaust outlet. A steam engineer would call this a "water hammer" and is the reason why many installations are not satisfactory.

The circulating water may be drained from the muffler by a separate outboard connection below the waterline or may be led into the exhaust pipe beyond the muffler.

As to the exhaust outlet itself, those advertised in the MOTOR BOATING are all good, but should be at least one size larger than the exhaust from the engine. It is a good plan to make this increase in size at the outlet of the muffler. The opening of the under-water fitting should be as large as possible to reduce the velocity of the issuing exhaust and of course should be pointed aft.

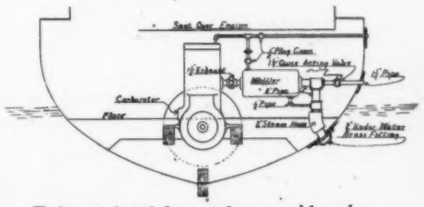
The introduction of water into the outlet is not necessary and is better left out if plenty of water is put into the muffler, as it takes up room and reduces the available space for the exhaust. The exhaust gases are principally products of combustion and must be contracted by cooling; they cannot be condensed as steam is.

In order to have any "suction" on the issuing exhaust, the passing water should have a velocity greater than the exhaust itself. This is seldom the case, but should be approached as nearly as possible, so put the under-water fitting well forward out of the following wave where the passing water will have the greatest velocity and where the exhaust gases will have a chance to keep away from the propeller. Put the outlet near the waterline yet not so close that every little roll will bring it above water.

The sketch shows an interesting installation; as the boat was beamy and slow and fitted with a moderate speed engine it presented all the difficulties mentioned.

The exhaust from the engine was 1½ inch to a cast iron muffler (simply an expansion chamber) from which led a 2 inch pipe to a 2 inch under-water fitting. The bypass or cutout was 1¼ inch fitted with a slide valve. Water connections were all ½ inch pipe.

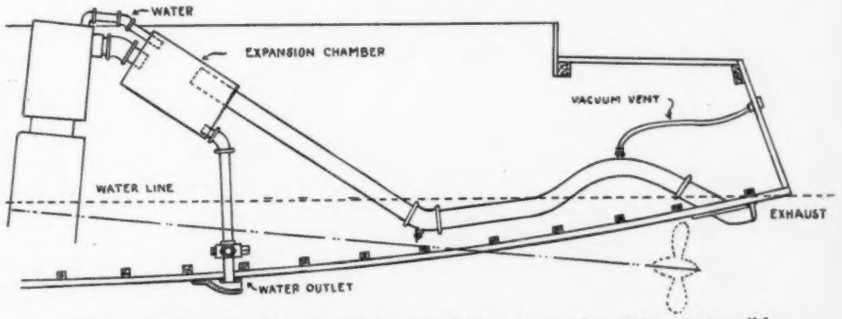
As the entire arrangement was on one side of the engine it left a clear passage on the other side and there were no pipes or mufflers to take up the room under the side or stern seats.



Exhaust head forward to avoid wake.

In actual operation it was found advantageous to open the cutout when starting up and to partly open it when running slow. When running normally actual tests showed a loss of only seven revolutions per minute when the cutout was closed tight. Opening the cutout slightly gave full engine speed yet did not allow noise enough to be heard over the click of valve and carbureter.

WM. GEO. ALLEN, Portland, Me.



The expansion chamber should be installed as near the motor as possible.

Efficiency Dependent on Several Points.

AN under-water exhaust passage requires the following points to make it efficient:

1. Early and rapid cooling of gases and reduction of pressure.
2. Cushion against slowly yielding sea water.
3. As little water moving through exhaust pipe as possible.
4. A vent for vacuum when engine is stopped and gases cool and contract.
5. Exhaust head so placed as to have (a) as little water pressure closing it as possible; (b) out of direct path of wheel in both moving forward and backing up; (c) far enough away from point of contact of surface of water with hull to prevent projecting of water completely away from it, thus forming a continuous tunnel to the surface. Should this latter occur, both noise and troublesome spray (for a towing tender) will be the result; (d) construction of the exhaust head itself so as to create a slight cavity in the water into which the exhaust gases fall after which they become entangled and broken up in the swiftly passing sea water.

The first three points can be obtained in constructing and placing an expansion chamber as shown. It should be:

1. As near the engine as possible.
2. Water inlet above exhaust inlet.
3. Water outlet well below exhaust outlet and 150% water inlet capacity.
4. Expansion chamber twice the volume of one engine cylinder.
5. Chamber well lagged with asbestos to deaden sound and protect engineer.

Fourth point carried out by tapping in small copper pipe at highest point of exhaust pipe (which latter should rise well above the waterline) and carried to skin of boat.

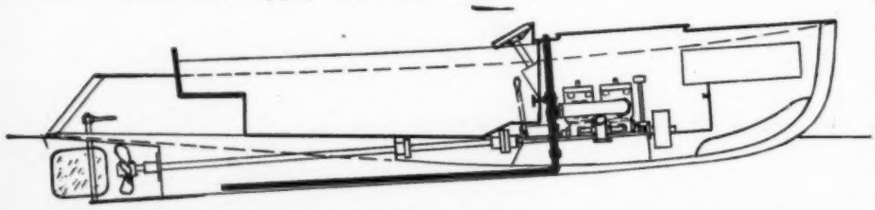
Fifth point accomplished by placing the fitting purchased from your dealer to one side and a little aft of wheel and not more than three inches below water and well away from surface. Should the exhaust be put out the side of the boat near engine one is liable to the disagreeable experience of the exhaust fumes being blown over the windward side of boat into the cockpit.

Should one prefer to not purchase the exhaust head but make it in the shop, an efficient one can be built up by letting the exhaust pipe go through the bottom of boat with the usual lock nut and washer upon both sides of planking and then forming a scoop of rather heavy copper plate by beating out upon an anvil.

W. H. F., Evansville, Ind.

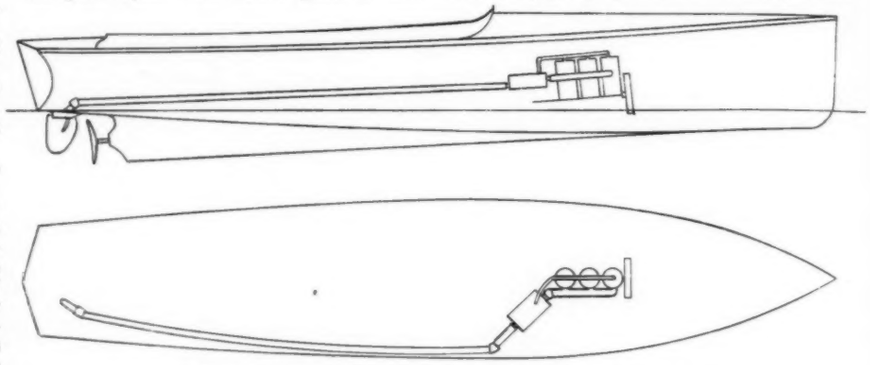
Exhaust Pipes Outboard Along Keel.

AN under-water exhaust works well when properly installed, while one that is not right is the cause of constant trouble. The arrangement described below is extremely simple, inexpensive, and easy to install. It consists of two pipes, outside and on each side of the keel, running from under the engine to within three or four feet of the stern. The manifold is connected through a T to these pipes, the other end of the T having a cutout valve. This valve is closed when running and the exhaust gases pass to the condenser pipes where they are rapidly cooled down to the temperature of the water, thus creating a vacuum and causing the gases to be literally dragged out of the cylinders when the ports open. The cooled gases in turn are sucked out of the pipes by the rush of water by the ends of the pipes. After shutting down the engine the cutout is opened, equalizing the pressure and preventing water being drawn up into the manifold. In starting, this valve is left open and the exhaust allowed free exit to the atmosphere; when the boat gets headway, the water in the condenser pipes is drawn out of itself, or by slowly closing the valve if not under headway, it may be driven out. Don't try to start up with the valve closed. No trouble is experienced in reversing, although there is a slight back pressure which is of no consequence since no one wants very high speed when running backwards.

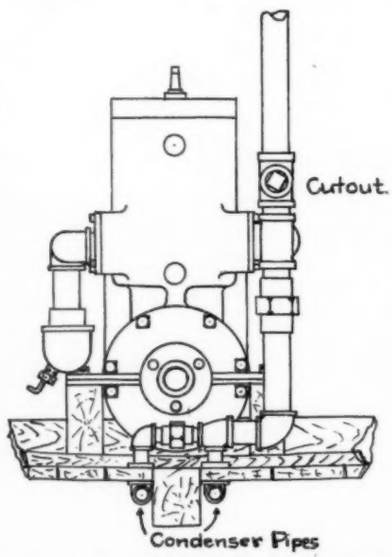


Mr. Goddard's design shows the exhaust pipes running outboard along the keel.

In selecting the condenser pipes, get them at least ⅔ the diameter of the manifold outlet and have them threaded at one end, on which put an elbow. The short lengths of pipe which pass through the bottom should be threaded from 1½ inch to 2 inches back from the end, depending on the thickness of the planking. On the long threads screw lock nuts, which can be obtained at any supply house, cut out a rubber washer and slip it over the pipe up against the nut and put this end through a tight fitting hole in the garboard strake. Then file the upper face of the elbow flat and square with the plank, put on another washer and screw the pipe into the elbow. By tightening the lock nut, a good tight joint results. The two condenser pipes should be securely strapped to the keel with brass strips. The inside piping depends entirely on the boat, but it should be as short and free from turns as possible. This exhaust is perfectly noiseless and will increase the speed of a boat using a muffler considerably.



In Mr. Sloan's diagram there are few bends in the exhaust piping.



Sectional view of Mr. Goddard's installation showing double exhaust.

R. W. GODDARD, Worcester, Mass.

Easy Bends in Exhaust Pipe Essential.

THE accompanying sketch shows what I have found to be the best installation of an under-water exhaust.

The reason for carrying the exhaust clear to the stern and letting it out there is to prevent the steam and fine spray from blowing over the occupants of the boat when the wind happens to be off the bow and boat is rolling.

There should be an expansion chamber close to the engine and into this part of the cooling water may be turned, this will insure a cool exhaust pipe.

The exhaust pipe should have a gradual drop from the engine clear to where it goes overboard, this will prevent any water from collecting in pipe; care should also be taken to use an expansion chamber or muffler which has an outlet at the lowest part so that the cooling water cannot collect here.

Use as few ells as possible and those you do use see that they are 45° ells or even better 22½° ells. Bend pipe gradually wherever possible to make a gradual bend or turn. A relief should be put in near engine for use when starting.

If one wishes to spend a little more money a copper tube of 18 gauge can be put in and with this all sharp bends can be dispensed with. Wherever it is necessary to bend this metal it is easily done by first annealing it and then filling solid with melted rosin, it can then be bent without buckling and the rosin then run out.

Where copper pipe is used have it fastened to a bronze flange and have this flange fastened to a cast iron flange on muffler with packing between the two if boat is used in salt water.

By all means use a good under-water exhaust lead for which I would advise you to consult the advertising pages of this magazine.

It is very important to have the exhaust aft of the propeller and not too close to the rudder.

Never reduce the size of exhaust pipe from engine, it is better to have it ¼ or ½ size larger.

W. HERBERT SLOAN, Baltimore, Md.

Buying a Second-Hand Boat.

Weaknesses, Wear and Defects, Where They Occur and How They May Be Determined. A Number of Practical Suggestions of Value to Those Buying Used Motor Boats.

THE PRIZE CONTEST—Answers to the Second Question in the April Issue.

Thorough Instruction.

The Prize Winning Answer.

IN giving the following pointers for the examination of a boat with its possible ownership in view I have simply attempted to enumerate the points which do not stand out prominently, the general appearance of the boat being a point which must appeal to the purchaser himself, varying of course with his taste and pocketbook.

If the boat is built for speed her model is hard to specify, but for an ordinary cruiser or open boat the beam should be about one-fourth the length, fairly high sides and not too flat on the bottom so that a fair amount of the boat is in the water.

If the history of the boat is not available her age may be ascertained by various methods, for instance by the style we can often tell that she cannot have been built before the date when that model came into vogue. In considering her general appearance in regard to age the care which the boat has received should be taken into consideration. As for the length of time a boat should be seaworthy I should say that fifteen years would be an average figure, although there are always exceptions to prove the rule.

If the boat is hauled out examine the bottom by sticking a knife into a few of the planks. If the wood feels soft and the cut closes up immediately after the knife is withdrawn the planks are not very sound. Some of the caulking should also be pulled out so as to get an idea of its condition. Take particular notice of the seam between the garboard and keel as this is about the hardest place to keep tight. Also look at the butts of the planks to see if any are split. Next examine the seams on the inside to see if they are tight enough to prevent the caulking forcing through. Go over the timbers carefully, especially just above the water line or between wind and water as they generally give out first here.

See that the shaft log is not split as about the only way to repair it is by putting in a new one. The condition of the deck is of course easy to judge and needs no comment.

By standing off some distance from the boat and sighting along the keel you can tell whether she is hogged much or not or in other words bent so that the center of the boat is high. If she is it is not necessarily detrimental to the boat but is an indication of weakness.

In going over a boat in the above manner both sides should be given equal attention as I have seen old boats quite sound on one side and in very poor condition on the other.

The power equipment should be taken up next.

Beginning with the tank, if it is empty press a stick around the joints to see if the metal is eaten away on the inside which is often the case with a galvanized tank. In examining the engine all the bushings should be taken out, if possible, to see if the shaft is scored as it is almost impossible to keep a bushing tight on a scored shaft. The bushings on the crankshaft should fit quite tight as the engine will lose compression through loose bushings. These are usually solid so must be replaced with new ones when worn out. The play in the connecting rod can usually be taken up. The cylinder walls should be given particular attention. There should not be any very large scratches if any, and the diameter at right angles to the crankshaft should not be more than a few thousands larger than the diameter funnel to the shaft.

If the engine cannot be taken down, try the compression by bringing the flywheel up slowly, almost to the center and then release it. If there seems to be a good pressure and the wheel bounds back, the cylinder is probably in good condition.

Work the flywheel back and forth to see how much play there is in the wrist pin and crank. There is always a little play at this point, but it should not be excessive. Some idea of condition of the crankshaft bearing may be obtained by lifting up on the flywheel.

If the spark is of the make and break type see that the exterior working parts are in good condition. If the contact points are worn much they are easily replaced.

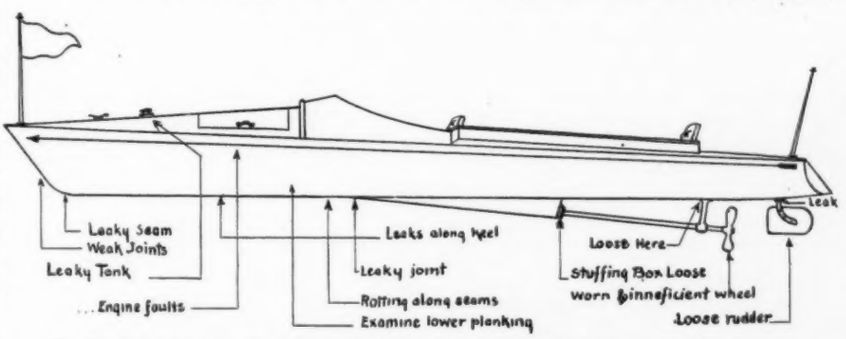
In case the boat is to be used in salt water the shaft and propeller should be of bronze. The stuffing box should not be worn out of round which is an indication the engine is not properly lined up. The rudder and shoe may be either bronze or galvanized iron provided the latter does not come in contact with any copper or copper alloy.

F. H. MALONEY, New Haven, Conn.

Poor Installation Common.

IN the accompanying sketch I have tried to show plainly just where the defects may usually be found on a used boat.

Generally the faults are in the form of leaks caused by the pounding of a poorly installed engine which is perhaps just a fraction of an inch too high on one side or just a shade too far forward or back causing the shaft to act as a lever, we might say, giving a circular motion and at the same time shaking and straining the boat, causing the opening of practically every seam from bow to stern. When a boat is offered you for sale examine it carefully in the places I have endeavored to show you and see if it is really a good boat which the owner wishes to dispose of perhaps to get a larger one or if it is one of the class I have described.



Mr. Snyder's diagram showing a number of places where defects are likely to occur.

Examine the engine in the boat you buy most carefully. See that the bearings are sound and true. This insures good base compression.

Look carefully at the pump. A good cool engine gives the best service in the long run and lengthens the life of the piston and cylinder head.

Examine carefully the oiling system, the coil and the timer. These three things are very important. The finest engine in the world is worthless without good fittings.

The carburetor you must *know to be all right.*

Do not buy until it has been thoroughly demonstrated with the engine at all speeds.

Thoroughly try every boat offered to you before you buy any one. A skillful or even careful man can get excellent results out of a boat and engine condemned as worthless.

J. W. SNYDER, Trenton, N. J.

Paint and Putty are Like Charity.

IT is not an easy matter for the amateur to examine a craft of uncertain age and arrive at her actual condition and approximate value. The experienced boatman begins his inspection of an old boat by poking into and examining the "wood ends" as the ends of the planking which rabbet into the stem are called. Here decay is first to be detected and here also the effects of hogging are apparent to the expert observer. The prospective purchaser should bear in mind always that paint and putty may and often do, cover a multitude of sins and he should prod into doubtful corners with his pocket knife in search of rotten places not visible to the eye. Another place which is worthy of careful attention is the run which being generally dark and ill-ventilated is apt to show rottenness as soon as any other part of the hull. The garboards should be looked over for signs of weakness, the seams at the rabbet giving a good idea as to the condition of things in this quarter.

If the hull is copper fastened it is safe to assume that no trouble is to be expected from the fastening. Galvanized fastenings will also last for many years. Occasionally boats intended for use on fresh water will be plain iron fastened. If such craft are offered for sale on the seacoast look out for them. Their fastenings will not last long in salt water.

Inspect critically the steering gear which may, if of iron, show symptoms of weakness caused by rust or galvanic action in the parts below the water line. This is very likely to be the case where a bronze wheel and shaft is used with rudder and skeg of iron.

It is well to look at the inside of the planking and ascertain if through straining of the hull or carelessness on the part of the builders the seams are open enough to allow of the caulking being driven through. This fault is one that is difficult to successfully overcome.

Should an intending purchaser detect any of the defects here mentioned he must rely on his own judgment as to whether he should attempt to remedy them or whether the case is a hopeless one and he had better continue his search. Where an engine is offered with a boat try to get permission to remove the cylinder heads and get at the pistons to find out if the rings are badly worn and make sure that the cylinder walls are in perfect condition. Remove the caps from the main bearings and see if the bearings are scored or badly worn.

Remember that a boat with high class fittings and furnishings will usually prove to be well constructed throughout and vice versa.

ALLAN O. GOOLD, Portland, Me.

IN the first place make some inquiries about the owner of the boat and the use to which she has been put. Examine, especially, the title and make sure that it is clear; in this connection it is not bad advice to recommend the services of a good yacht broker, he will attend to all the formalities and you can be sure that you will not be "stuck".

In examining the boat itself, always insist on having her hauled out; this is the only way in which you can have a fair chance to examine her underbody. If she has just had a coat of paint it is your misfortune, for paint is like charity, as far as covering goes. But you can scratch a little of the paint off in places and get a pretty good idea of her bottom.

The first thing to be examined is her underbody. Take your pocket knife and, starting at the keel, stick it into the wood at various places. If you find any spots where the knife sinks into the wood too easily, try to outline the area. It may be that the price is so low that you can afford to replace a plank and still have a bargain. These soft places indicate that the boat has rotted or that the teredo has been at work. If the areas of soft wood are very large, refuse the boat at any price.

When you have satisfied yourself that the planking is sound go up forward to where the planks fit into the rabbet on the stem. See whether the planking still fits. The boat may have hogged, that is the ends are lower than the middle. This is caused by a structural weakness that has been strained by running aground or into a pier; it is also caused by a bad disposition of the weights; as a large heavy engine aft and large tanks forward. Or, equally as bad, the hull may have sagged.

Have Boat Hauled Out.

Next get inside of the boat and have the floor boards lifted so that you can see the condition of the bilge. Test the frames in the same manner that you tested the planking; make sure that the majority of them are solid. If possible look at the bilge of the boat—the place where the frames curve most—and see if the ribs have been properly steamed when the boat was being built, so that they are not cracked and split. Make a note of the fact if the boat has been fastened with rivets as this is a point in favor of the boat.

Open up all of the lockers and see if they are dry and smell sweet and if the wood of which they are made is good and sound. If it is not it is a pretty good sign that the boat has been leaking recently and she may have been made tight temporarily in order to sell her.

Examine the deck well, probing into all of the seams to see if the caulking is solid and that they are well payed. If the decks and cabin tops are canvassed, see that they have been kept well painted and that the canvas is in good condition. Note, also, the seam between the cabin sides and the deck, making sure that the seam is tight. A leaky cabin is one of the most annoying things I know of. This seam is frequently opened by repeated caulkings.

Before putting the boat back in the water see that her rudder, shaft and strut are in good condition. If the boat is used in salt water and the shaft is of bronze while the rudder is of iron, have this changed, as there is a very pronounced electrolytic action between these two metals.

If she has been hauled out for several days she will leak a little until she has had a chance to swell. Have the owner take you on several long trips so that you can note the workings of the engine. This is about all I am going to say about the engine; the average amateur is unable to give an engine a minute examination and draw any valuable conclusions. Better get an expert. Besides the space at my command is limited and the engine requires a book in itself.

GAIL S. YOUNG, Galveston, Tex.

What Are the Advantages of Flare?

Will the Growing Tendency For More Flare in Motor Boats Produce Better Craft? A Discussion of Its Desirability for Both Speed Boats and Cruisers.

THE PRIZE CONTEST—Answers to the Third Question in the April Issue.

Moderate Flare and Flam Desirable.

The Prize Winning Answer.

IT has long been an accepted fact among boatmen that a certain amount of flare is beneficial in vessels designed for rough water use. Those conspicuously seaworthy craft, the fisherman's dory and the New Bedford whaleboat, are both characterized by a considerable amount of flare, not only forward but throughout their entire length. In decked vessels, too, the full deck line provides very acceptable room for the handling of lines and ground tackle without the necessity of full waterlines and the consequent loss of speed.

In craft designed for racing and other high speed service it is necessary to strictly limit the weight of the hull and in consequence the freeboard is kept low which, together with the narrow beam and extremely sharp lines of such boats, makes the attainment of seaworthy qualities very difficult. Here the benefit of flare in the forward sections is very apparent. The reserve buoyancy thus secured prevents burying in the seas and the spray is thrown outward and away from the boat, adding greatly to the comfort of her occupants.

It is common practice at present to introduce a reverse flare or "flam" in the upper portion of the forward sections of speed boats and sometimes, indeed, of vessels having considerable freeboard. This reverse flare is designed to allow of sharp waterlines carried well up above the line of flotation forward to prevent undue checking of the boat's speed when driving into a moderate sea, while above that point the buoyancy of the hull increases rapidly to provide lifting power. Thus in rough water the seas are turned over and thrown sharply downward.

In seeking the form of utmost seaworthiness for a cruiser the modified whaleboat type with flare all round is probably to be preferred. In all models, however, the forward flare is always retained, even though an extreme "tumble home" aft is often noticeable in craft having the square transom or Normand V types of stern.

The disadvantages of flare lie entirely in its misuse, usually through exaggeration or through its introduction too close above the waterline. In the former case a flare may be so abnormal as to appear ridiculous and the resulting "crankiness" may be such as to cause the weight of a man boarding from a float to heel the craft down to an uncomfortable angle.

In the last mentioned evil the excessive buoyancy of the forward body causes needless loss of speed in broken water, the forward sections gaining fullness so rapidly from the waterline up as to cause the bow to pound heavily, straining the hull and producing a smother of spray about the bows, much of which will find its way inboard.

ALLAN O. GOOLD, Portland, Me.

Flare Reduces Speed.

FLARED sides on any boat are for the purpose of increasing her buoyancy in a seaway, and at the same time cause her to throw or roll the wash from her bows aside thus preventing it from coming on deck. In other words they are designed to make her a dry boat in heavy weather. This action is bound to reduce the speed somewhat as it will require more energy to repel these waves than to allow them to wash over the decks.

Assuming that a speed boat is built for speed without regard to comfort, the flared sides will to some extent be a detriment, as the fact has been demonstrated time and again that such a boat is not meant for heavy weather and is not of much use if caught in a seaway, her fine lines and speed tending to drive her through instead of over the waves.

With a cruiser it is much different, as strictly speaking, the word "cruiser" means a boat built for comfort and pleasure and one on which one may live aboard for an unlimited time. A boat of this type will necessarily have to be seaworthy, and speed will be an important factor, hence the flared sides will prove an advantage in every way as they will tend to make her more buoyant, a drier boat in a seaway, and will add to the comfort of her occupants.

HARRY J. HUNTER, Newark, N. J.

Flare Prevents Rooting.

ONE advantage of flared sides in both speed boats and cruisers is that it gives more deck room than the straight sided boat, and on the same wetted surface; this is particularly desirable in the cruiser, though it is scarcely any advantage in the speed boat. The cruiser with the flared sides will always "go down hard"; i. e., the more weight put into her the harder she will sink into the water, because her width is constantly increasing. On the other hand a boat with very much flare and which has a more or less "barrel-like" form, or section, will be very apt to be quite "tender," that is, roll very easily, which is generally annoying, and many times inconvenient, to say the least.

When the question of flared sides at the bow is considered, this flare, especially a reverse curve flare, is surely a decided advantage. It has a great tendency to throw off and out the sheets of spray that would otherwise fall back into the cockpit. In high speed racing motor boats this is of untold benefit. It protects the helmsman from that constant, almost unendurable shower of driving spray which comes from a flat, straight sided bow when driven hard in any kind of of a seaway. The slight detriment it causes on account of the small extra weight is more than offset by the great comfort it affords the helmsman.

On a cruiser this reverse curve flare is of use in protecting the helmsman from spray just as much as in the case of the speed boat. This protection is not to be scorned by any means, for it no easy task to "drive" a boat into a nasty head sea and wind on a cold, chilly night. Then the additional deck room it gives forward means everything, especially when handling an anchor in a stiff wind and a heavy sea. In anything under a forty-footer this is a ticklish job, and a few inches more width is often times a great aid.

This sort of a flare also enhances the seagoing qualities of a boat, because it prevents her "rooting" excessively in a high sea. This prevents her propeller getting out of the water every time she dives.

C. D. D., Marblehead, Mass.

More About the Under-Water Exhaust.

Views of the Manufacturers of the Various Exhaust Devices on Methods of Installation. Diversity of Opinion Would Indicate That Several Methods Are Successful.

The first contest question answered in this issue is in regard to the installation of an under water exhaust; a question of vital interest at the present time. In order to make this discussion of as much practical value as possible to our readers a letter was sent to all the manufacturers of under water exhausts requesting that they send us their ideas on the subject, and the following are the replies that were received.—EDITOR.

Hose Connections Recommended.

THE Hydrex Subsurface Exhaust Outlets, manufactured by the Hydrex-Silent Exhaust Works, of Newburgh, New York, may be used either with or without the Hydrex Silencer, manufactured by the same company. They recommend that it be placed as far aft as possible and about on the waterline or even above the waterline so that when the boat is under way it will come just beneath the surface. It should be placed at least 2 inches aft of the propeller and either in the center or to one side. A brass plate, the same size as the flange of the outlet, and with corresponding holes may be placed inside the planking to support the burrs. There should be a rise of about 6 inches from the exhaust head to the piping and in order to make a flexible joint to reduce strain and vibration, hose is recommended in making the connections. An expansion tank or Hydrex Silencer may be used in the system and should always be used, where the exhaust is let out the side of the hull several inches below the surface of the water. The Hydrex Silencer has a number of improvements over the ordinary expansion chamber and is recommended for this purpose.

2 Inches Aft or 4 Feet Forward of Propeller.

THE exhaust head manufactured by Charles Kaufman, of Oshkosh, Wis., is held in place by a lock nut on the inside of the planking. He recommends that it be placed as far aft as possible, and at least two inches aft of the propeller. It may be fastened to one side or directly over the line of the propeller and should be so placed that when the boat is running it will not be more than from three to five inches below the surface. If the exhaust head is to be placed forward it should be from 4 to 8 feet ahead of the propeller and not more than 2 inches under the waterline. An expansion chamber, which should have a volume three times that of the cylinder can be used to advantage, especially with a two cycle engine, and it should be placed near the engine. The piping for the exhaust must be at a point near the exhaust, at least 7 or 8 inches higher than the water level to prevent the water from backing up; and to reduce friction, 45 degree ells should be used of a size larger than that from the engine exhaust. The exhaust fitting, however, need be no larger than the engine exhaust. In all cases the exhaust should be cooled by a connection from the water jacket.

Expansion Chamber Necessary.

THE Motor and Manufacturing Works Company, of Geneva, New York, manufactures the Reid Rational Underwater Exhaust. To obtain the best results they recommend that the exhaust be placed from 3 to 5 inches under water measured to the top of the outlet when the boat is under way, and as far aft as possible. Avoid placing the exhaust in front and in line with the propeller. As exhaust gas issues from the exhaust pipe at about 6,000 feet per minute, it is evident that unless a boat is to travel at this rate of speed an expansion chamber is necessary to avoid loss of power. To fit the exhaust, bore a hole through the boat large enough to allow the threaded part to pass through, placing a rubber washer against the outside of the boat and a wood washer on the inside, over which comes the lock nut. For torpedo stern boats this company recommends the use of two small exhaust heads, one on either side of the propeller wheel, leading from the same expansion chamber.

Installing a Balanced Exhaust.

THE subject of submerged exhaust outlets, says the Mechanical Devices Company, of Watervliet, New York, has for years been a subject of controversy, which, within the last few years has been decided in their favor, as it has been found that aside from stopping the noise of the exhaust a properly designed and installed underwater exhaust actually increases the efficiency of the motor. In order to produce the best results it is necessary to have the submerged outlet placed sufficiently under water to produce a suction when the boat is under way, and it is detrimental to place a muffler on the exhaust line, as in this case the exhaust does not follow the direct draught created by the outlet. It should not be placed too near the propeller as it is likely to disturb the water flowing to same. It is good practice to increase the size of the exhaust pipe and the size of the balanced submerged outlet. For instance, where the engine outlet is 1½ inches, it is advisable to use a 2 inch pipe and 2 inch exhaust outlet. An outlet to the atmosphere should be led from this pipe to permit the exhaust gases to escape when starting. This should also be opened immediately on stopping the engine, as this prevents the formation of a vacuum which would tend to draw water into the system. In installing a submerged exhaust, it is advisable to reinforce the spot with a piece of plank long enough to extend over several of the frames, over which it should be scarfed, and wide enough to straddle the adjacent seams. Bolts with the washer and nut on the inside are used to secure the exhaust head and a canvas gasket well doped with white lead or marine cement should be used beneath the flange. Flexible pipe fittings are recommended to make the connection with the exhaust piping, instead of rubber hose, which deteriorates rapidly through the action of the hot gases. It is also advisable to pipe the circulating water into the exhaust line below the exhaust outlet from the engine and, if possible, some other connection than a T fitting should be employed, so that the water will enter the line with the flow of the exhaust, rather than at right angles to it.

Keep Piping Above Water Line.

THE American Submerged Exhaust Company, of Newburyport, Mass., manufacturers of the Goodwin Submerged Exhaust Device, recommend that the exhaust head be placed 4 to 6 inches under water, where it will, at all times, get a good flow of water through the tunnel or forward end. Pipe from the engine to an expansion chamber and from it to the exhaust head, keeping all horizontal piping and expansion chamber above the waterline. Pipe the circulating water into the top of the expansion chamber and then outboard from the bottom.

Expansion Chamber 6 Times Cylinder Volume.

IN order that the exhaust shall flow continuously through the exhaust nozzle, the Cavito Underwater Exhaust Company, of Grand Rapids, Mich., recommends that an expansion chamber be used, with the possible exception of the smaller sizes of four cycle engines, and as the gases may be assumed to expand to about six times the original volume, the expansion chamber should be six or seven times the volume of the cylinder. On or before entering the expansion chamber the exhaust should be subjected to a stream of water from the circulating system, which will cause a great contraction in its volume. A sufficient amount of water must be piped into the exhaust line to prevent the formation of steam and this may be led off from the bottom of the expansion chamber if its volume is sufficient to obstruct the line. It is advisable that the exhaust nozzle and piping be plenty large enough and in some cases of multiple cylinder motors, it is advisable to use two outlets. It is recommended that a Cavito underwater exhaust head be used and as large or preferably a size larger than the engine exhaust.

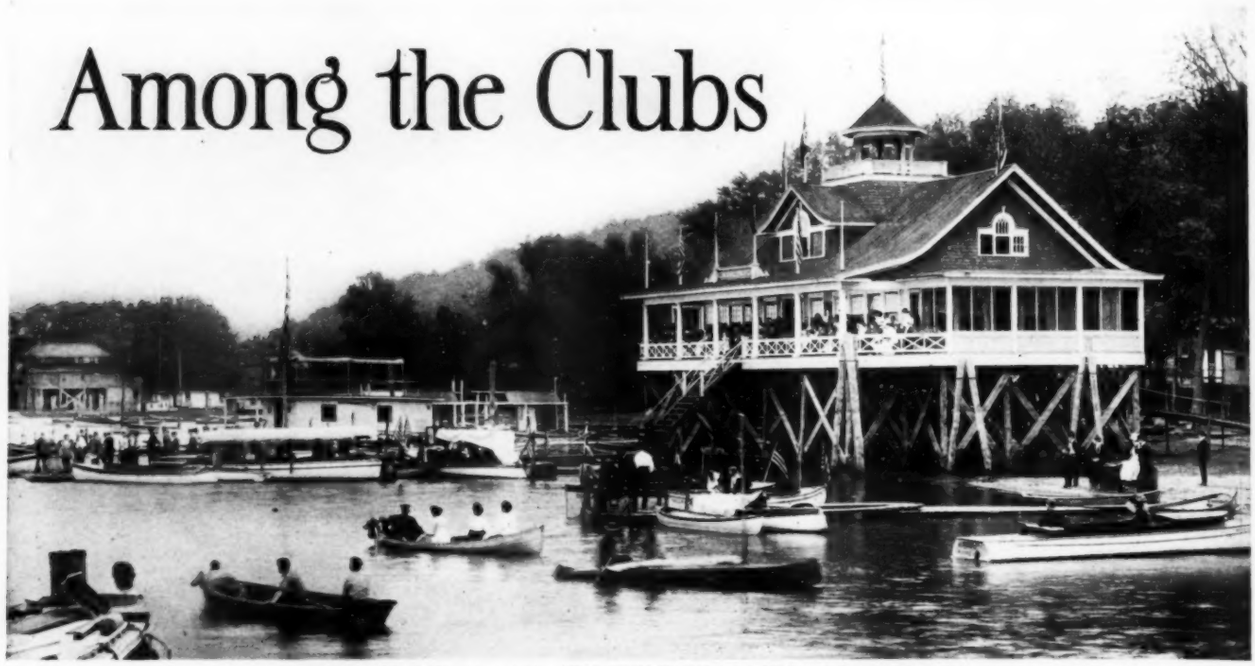
No Back Pressure.

SINCE the advent of the internal combustion engine, how to overcome the noise of the exhaust has been a great problem and now that special legislation has been enacted in many states requiring that the exhaust must be muffled, the question is at its height. The Truscott Boat Manufacturing Company, of St. Joseph, Mich., have produced the Trusco Submerged Exhaust, which is installed as a part of the equipment of their boat. In the Truscott installation the expansion chamber is placed to one side beneath a seat or in a locker. All the piping that is used is a short piece from the engine to the chamber and another short connection from the opposite end of the chamber to the exhaust head, which is placed several inches below the surface of the water. This arrangement, though simple, has effectually demonstrated its ability to silence the exhaust without the production of back pressure.

As Far Aft as Possible.

UNDERWATER exhausts, says the Michigan Wheel Company, of Grand Rapids, Michigan, should be placed as far aft as possible in the stern and center of the boat within one or two inches below the waterline. A rubber packing should be used between the exhaust head and the boat. The exhaust pipe should drop immediately into the exhaust head and be at least 8 or 10 inches above the waterline, so that the water will not enter it when backing up. It is not absolutely necessary to use an expansion chamber in connection with some of the makes of underwater exhausts, which are so constructed that the water will pass through the exhaust head, causing a suction or vacuum or acting as a steam injector, thus drawing the gases out by the flow of the water. There is no noise, back pressure or disagreeable gases from a well-designed underwater exhaust and if installed as above, the exhaust head manufactured by the Michigan Wheel Company will absolutely eliminate these three objectionable features.

Among the Clubs



Labor Day Regatta at the Illinois Valley Yacht Club, Peoria, Illinois.

Thousand Islands Yacht Club, Alexandria Bay, N. Y. The dates for the races for the Gold Challenge Cup of the American Power Boat Association which was won two years ago by Dixie II for this club and last year successfully defended by her have been fixed for August 4th, 5th and 6th. This race is one of the most important motor boat events of the year and it is expected that the present season will furnish the most interesting events that have been held. The New York Motor Boat Club has also challenged for the trophy with Intruder, recently launched for F. K. Burnham, as its representative. It is stated that four other boats are now building which will be eligible to race under the conditions of the deed of gift and from which great things are expected in the way of speed. Among these is the new Hoosier Boy, the successor of the western speed boat of that name.

Taunton Yacht Club, Dighton, Mass. This club has issued complete programs of events for the season of 1910 extending from May 30th, the opening day, until about October 14th and includes many races, cruises, regattas and entertainments of various kinds. The officers for the present year are: Commodore, Albert A. Ormsbee; vice-commodore, Joseph S. Williams; rear-commodore, Louis M. Witherell; secretary, George W. Reichenberg; treasurer, Frederick E. Goff; fleet captain, Lester O. Thomas.

Motor Boat Club of America, New York. Frederick K. Burnham, owner of Dixie II and Intruder, was recently elected to membership in this club and at a dinner given in his honor by Commodore Melville, of the New York Yacht Club, his election as rear-commodore of the organization, vice Henry R. Sutphen, resigned, was announced.

Tamaqua Club, Sheepshead Bay, N. Y. This club, which was organized on April 1st for the promotion of motor boating, sailing, rowing, canoeing, etc., has chosen the following officers: President, James Keegan; vice-president, Thomas Grace; secretary, E. J. Poli; treasurer, Louis Poggi.

Dubuque Motor Boat Club, Dubuque, Ia. This is a recently formed organization and officers have been elected as follows: Commodore, St. Clair Edes; vice-commodore, J. Taylor; club physician, Dr. C. S. Brownson; measurer, George Schreiner; secretary, C. B. Scherr; treasurer, Louis Lubck. Plans have been perfected for membership in the Mississippi Valley Power Boat Association, and it is expected that a large regatta will be held at Dubuque during the summer.

Ocean City Yacht Club, Ocean City, N. J. The members of this club are planning for the largest season in its history and the membership limit of 250 has already been reached so that future members are placed upon a waiting list. A number of new yachts will be added to the fleet and the present number of 87 craft will be considerably increased. Several cruises have been planned and various interesting motor boat races.

Davenport Yacht Club, Davenport, Iowa. The following officers have been elected for the ensuing year: Commodore, T. H. Lembrecht; vice-commodore, E. H. Van Patten; rear-commodore, W. F. Kroy; secretary, Louis G. Bein; treasurer, William Hetzel. Work upon the club house is progressing rapidly and the members are looking forward to a prosperous season.

Bayside Yacht Club, Bayside, N. Y. Three weeks have been added to the season of the club this year, the opening day being May 7th instead of Decoration Day, as in previous years. An attractive publication illustrated by sketches and containing much useful information to club members is being issued monthly. The officers of the club are commodore, G. W. Smith; rear-commodore, J. F. Calder; secretary, W. H. Johns; treasurer, F. Floyd Jones; measurer, W. J. English.

Tar Heel Motor Boat Club, Washington, D. C. This club has recently been organized for the promotion of motor boating on Pamlico River and officers have been elected as follows: Commodore, Dr. J. C. Rodman; vice-commodore, C. L. Morton; secretary and treasurer, C. L. Payne.

Robbins' Reef Yacht Club, Bayonne, N. J.

Utica Motor Boat Club, Utica, N. Y. Final arrangements for the organization of this club have been completed and the charter was closed with 35 charter members. Various committees were appointed to attend to further details and it is planned to have a boat garage to be used for visitors and transients.

Pushaw Lake & Penobscot River Motor Boat Club, Old Town, Maine. Owing to the efforts of this club it is expected that an open channel can be maintained through the lake and river during the coming year. The fact that logs have been floated down in former years made motor boating a dangerous sport and prevented boats from making headway in any direction, especially through the passage connecting Pushaw Lake with the waters of the Penobscot. The following officers were elected: Commodore, E. M. White; vice-commodore, C. H. Estes; treasurer, F. J. Perkins; secretary, W. C. Mutty.

Holly Beach Yacht Club, Holly Beach, N. J. It has been decided to hold the race from Holly Beach to Camden, an estimated distance of one hundred miles, on July 26th, and although a time limit of ten hours has been set it is estimated that only about half that time will be consumed by the winner. Ten cups have been offered by the club to be competed for in three groups under the rules of the American Power Boat Association, namely, those rating between sixty and seventy, seventy and eighty, and eighty and over with an additional prize for the boat making the fastest time. The race is primarily to demonstrate the seaworthiness of a modern speed boat. Arrangements will be made to have relief boats stationed along the river and convoys will follow the contestants to render assistance if necessary.

Columbia Yacht Club, 86th St. and Hudson River, New York. On June 4th the opening day for the season, open races will be held for all classes of power boats as follows, starting at 2 P. M.: Open motor boats, all ratings, except dories, of less than fourteen miles an hour; power dories, all ratings; speed boats making over 22 miles on hour; cabin cruisers and hunting cabin boats, all ratings, not over 80 feet load waterline; semi-high speed boats making from 14 to 22 miles an hour. The start and finish lines will be directly in front of the club house and valuable prizes will be awarded in all classes. Communications regarding entries should be addressed to the Race Committee.

Gravesend Bay Yacht Racing Association, Bensonhurst, N. Y. Delegates from the Bensonhurst, Atlantic, and Brooklyn Yacht Clubs, New York Canoe Club, Marine & Field Club and Crescent Athletic Club were present at a meeting held recently at the club house of the Crescent Athletic Club in Brooklyn and formed the Gravesend Bay Yacht Racing Association.

Columbia Yacht Club, Baltimore. At a recent meeting of this club it was decided to enlarge the club house and build an extension to the pier in order to accommodate the increase in the membership of the club. The following officers were elected: President, M. J. Serbe; vice-president, George Serbe; commodore, N. Hucke; rear-commodore, John Fugman; secretary and treasurer, E. L. Jacobs; corresponding secretary, H. Waldman; fleet captain, N. Kuhner; measurer, John Mann; fleet surgeon, W. F. Serbe.

Robbins' Reef Yacht Club, East 46th St., New York Bay, Bayonne, N. J. This club was organized in 1906 with eleven members and headquarters at the foot of East 44th Street and New York Bay. In a short time the membership grew to such an extent that it was found necessary to locate in larger quarters and incorporate. This resulted in the purchase of the property where it is now located, measuring 100 x 300 feet, upon which is a 14-room house which was built at a cost of $12,000. A workshop and marine railway have been constructed and a pier extends a distance of 300 feet near which is one of the best equipped gasoline stations on the shore. The house is handsomely furnished and well arranged, containing, in addition to sleeping quarters, a large dining room, cafe, card room, etc. The officers are as follows: Commodore, F. J. Mueller; vice-commodore, Herman Brugel; rear-commodore, Theodore Koerner; recording secretary, Fred Golding; financial secretary, C. D. Stalling; treasurer, Val. Steinmetz; measurer, C. G. Bush; fleet surgeon, Dr. P. T. Stevens.

Portland Motor Boat Club, Portland, Ore. The following officers have been elected for 1910: Commodore, C. W. Boost; Vice Commodore, Geo. Kinnear; Fleet Captain, Dr. Jack Yates; Fleet Surgeon, Dr. W. B. Spencer; Secretary, J. B. Welch; Treasurer, C. W. Cooper.

Motor Boat Club of Savannah, Savannah, Ga. The regetta committee of this club, through Chairman E. M. Nichols, is sending out to interested parties a request for suggestions for the coming racing season. The letter states that a relay race has never been attempted by the club but should prove very interesting if properly run. Other events which are being considered are regular handicap races and a cruising race to Beaufort, S. C., and return on July 4th.

A Good Resolution.

The New York Motor Boat Club prides itself upon the fact that all of its members are thoroughly acquainted with nautical etiquette and rules of the road, and it has been proposed that they carry a visible sign upon their craft to indicate that they do possess such knowledge. According to the Bulletin, the official organ of the club, to the end that the Masters', Mates', and Pilots' Association and kindred organizations may be given a written guarantee that the operators of vessels flying the burgee of the New York Yacht Club are competent to handle their craft, the following motion was made at a recent meeting: "That no member of this club will be permitted to fly the club flag until he has passed an examination showing his knowledge of the rules of the road as contained in the Government Pilot Rules, and received a certificate to this effect from the examining board, which shall consist of the Flag Officers of the club. And the examining board may, in their discretion, issue a certificate to a member who does not operate his own boat, but does employ competent persons for that purpose."

Great Lakes Power Boat League, Buffalo, N. Y. This organization was recently formed to embrace the power boat organizations of the Great Lakes and includes seven clubs at present. Officers were elected as follows: Commodore, Dr. Albert E. Hubbard, past commodore of the Buffalo Launch Club; vice-commodore, W. E. Scripps, commodore of the Detroit Motor Boat Club; rear-commodore, C. H. O. Pook, president of the Canadian Power Boat Association; secretary and treasurer, Frank M. Martin, secretary of the Buffalo Launch Club; treasurer, Mr. Fisher, treasurer of the Motor Boat Club of Buffalo. It was desided to hold the firt regatta of the new organization on July 28, 29 and 30. Races will be run ovver the course before the club houses of the Buffalo Launch Club and the Motor Boat Club of Buffalo on the Niagara River.

Fall River Yacht Club, Fall River, Mass. An elaborate program of races and regattas has been perfected by this club for the coming season, and a number of new vessels have been added to the fleet. An invitation has been received from the New Bedford Yacht Club to join them on their annual cruise to New London on June 29 to witness the Harvard-Yale boat races, and it is likely that the invitation will be accepted. This cruise includes a run to Greenport, Block Island, Newport and Martha's Vineyard. Rear-commodore Charlton's new 75-foot cruiser Edamena is expected to go into commission on Memorial Day, and this vessel will be the largest in the fleet of the club.

Moline Launch Club, Moline, Ill. The members of this club are planning to hold a regatta and river carnival here this summer, in addition to a regular series of races which will be held every month. The clubs of Rock Island and Davenport will be invited to join in the regatta and river carnival. 175 feet of shore line have been secured on the west side of the Moline bridge and Commandant Hobbs has given permission to launch a float there, which will shortly be placed in the water. The club has been recently organized and has a membership of fifty to which it is expected to add 100 more in a short time.

Mississippi Valley and Western Power Boat Association Regattas, Peoria, Ill. These races, which will be held on July 4th, 5th and 6th, and on August 30th and 31st, respectively, are attracting intense interest and it is said that in Davenport alone eight boats are being constructed, each of which is capable of breaking an existing record. The chairman of the racing committee has issued a circular letter to manufacturers stating that donated articles would be acceptable as prizes, and the result has been highly satisfactory. Owing to this generosity on the part of the manufacturers there will probably be third, fourth and fifth prizes in almost every event.

Midget Squadron of Jamaica Bay, Boegel's Pier, Bergen Beach, L. I. This new motor boat club starts with a membership of 100 active members and sixty power boats in the fleet. The following officers have been elected for the year: Commodore, C. W. Mead; vice-commodore, Fred Boegel; 1st division commander, W. C. Hembler; 2nd division commander, E. D. Ainslee; 3rd division commander, W. C. Furley; engineer, E. G. Wadsworth; secretary, Wal. Edgerly; treasurer, S. E. Brooks.

June 4: Columbia Yacht Club, New York City.—Open races, 5 classes, starting at 2 p. m. from front of club house, 86th St., Hudson River.

June 16-19: Portland to Augusta.—Annual cruise of the Portland (Me.) Power Boat Club.

June 18: Chicago to Michigan City.—Fifth annual race of Columbia Yacht Club.

June 19-21: Houston, Texas.—Fourth annual regatta of Houston Launch Club, open to all boats on the Gulf.

June 25: Bermuda Race.—Starts from lower New York Bay and is run under the auspices of the Motor Boat Club of America.

July 2: Brooklyn, N. Y.—Start of annual regatta held by the Brooklyn Yacht Club over the Cape May course.

July 2: Chicago to Muskegon, Mich.—Race for the Racine Cup, held by Columbia Yacht Club.

July 2: Sea Isle City, N. J.—Open regatta for all classes held by Sea Isle City Yacht Club.

July 2-5: Cleveland, O.—Annual regatta of Lakewood Yacht Club held on Lake Erie.

July 4: New York to Albany and return.—Held by New York Motor Boat Club.

July 4: Honolulu Race.—Starts from San Pedro, Cal., and is open to regular club boats under 80 feet L. W. L. Approximate distance, 2086 miles.

July 4-6: Mississippi Valley Power Boat Assn. Regatta.—Peoria, Ill. Held under the auspices of the Illinois Valley Yacht Club. William S. Kellogg, Jr., secretary racing committee.

July 4-9: McKeesport, Pa.—Regatta of McKeesport Launch Club.

July 8: Atlantic City, N. J.—Start of annual ocean race held by the Yachtsmen's Club of Philadelphia over a 140 mile course.

July 9: Cleveland, Ohio.—Open regatta for championship of city of Cleveland, held by Cleveland Yacht Club.

July 16-19: Chicago to Charlevoix, Mich.—Relay Race held by Columbia Yacht Club.

July 16-23: Baltimore, Md.—Annual cruise and regatta of Chesapeake Bay Yacht Racing Association.

July 18-24: Put-in Bay, Ohio.—Annual regatta of Inter-Lake Yacht Racing Association of Lake Erie.

July 23-30: Brooklyn, N. Y.—Annual cruise of Brooklyn Yacht Club.

July 26: Holly Beach to Camden.—Race for open speed boats held by Holly Beach (N. J.) and Camden (N. J.) Yacht Clubs.

August 4, 5, 6: American Power Boat Association.—Gold Challenge Cup Races held at Alexandria Bay on the St. Lawrence River, Dixie II, representing the Thousand Islands Yacht Club, defending the cup.

August 13: Boston.—Open power boat race for boats from 30-40 ft. L. W. L. held by Boston Yacht Club.

August 20: British International Race.—Race for the Harmsworth Trophy, held in Larchmont harbor, on Long Island Sound, under auspices of the Motor Boat Club of America, the present holder of the trophy.

August: Alaska-Seattle Race.—This race will probably start during the third week in August and will run from Juneau, Alaska, to Seattle, a distance of over 1000 miles.

August 27: Chicago to Peoria.—Start of cruise of Columbia Yacht Club of Chicago.

August 30-31: Western Power Boat Assn.—Second annual regatta held at Peoria, Ill.

September 5: Chicago, Ill.—Annual regatta of Calumet Power Boat Club under auspices of Western Power Boat Association.

September 5: Hudson River Yacht Racing Assn.—Annual regatta held at Ossining, New York.

September 5: McKeesport, Pa.—Regatta held by McKeesport Launch Club.

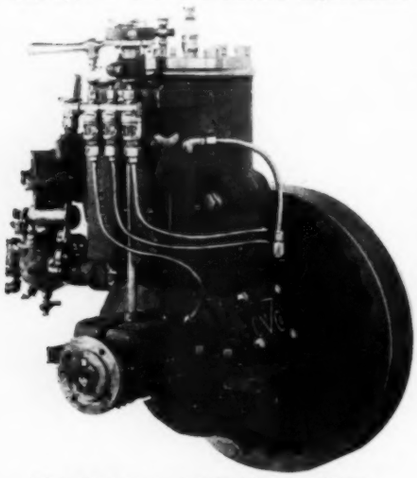
September 17: Niagara Falls, N. Y.—Power boat race through the Whirlpool Rapids to Lewiston.

October 8: McKeesport, Pa.—Regatta held by McKeesport Launch Club.

Motors for Motor Boats.

The Type G Fairbanks-Morse.

The new type G manufactured by the Fairbanks-Morse Company takes the place of their 1909 type F and is a marked improvement

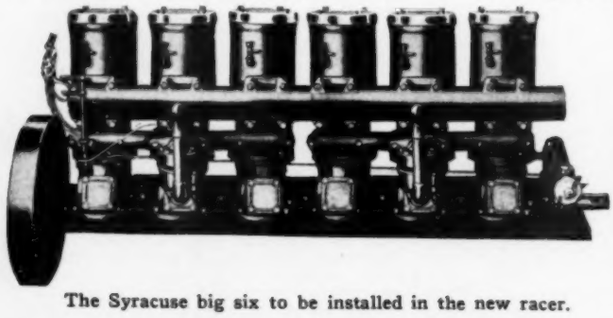


The 6-horse type G Fairbanks-Morse.

over the latter. It is built in sizes from 6 to 45 horse power and is made in 1, 2, 3, 4 and 6 cylinders, embodying all the latest improvements, a special feature being the "auto control" which makes it particularly adapted to boats where the engine is located forward and controlled from the cockpit. The illustration herewith is of the 6 horse power, single cylinder size; it is of the 2 cycle, 3 port type, cylinders being 4½ inches by 4½ inches. Another feature of this engine is a device in the nature of a screen placed in the passage leading from the base to the inlet port which prevents back firing as the flame cannot pass beyond the screen. A forced feed system of lubrication is employed without, however, any mechanism whatever, as the compression in the base of the engine is used to force the oil. The inner face of the fly-wheel rim, it will be seen is notched to afford a hand hold and in starting the engine it is only necessary to turn it through a small angle either way, thus avoiding the danger of kicking back as is the case when the crank is employed.

The Syracuse Big Six.

This is the latest engine to be put on the market by the Syracuse Gas Engine Company, of Syracuse, New York. It is the model 6 D. The bore is 5½ inches, the stroke 5½ inches, and the rating is 95-120 horsepower. This model was designed especially for high speed work and is extremely light

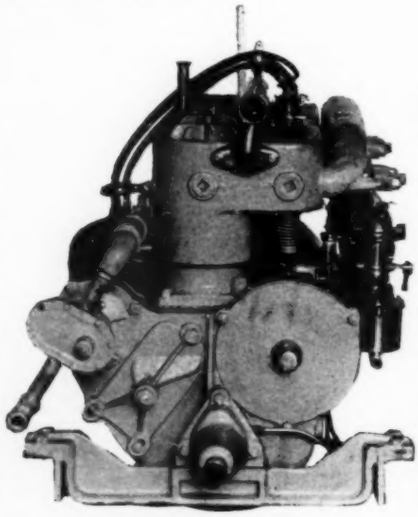


The Syracuse big six to be installed in the new racer.

for its power. It has the Syracuse patented combination water jacketed condensing exhaust, which gives the carbureter hot, dry air, cools the firing chamber, brings cold water in direct contact with the exhaust, causing quick condensation of gases and preventing back fire, and also insures the complete and positive scavenging of the firing chamber before the inrush of new gas. Ignition is by the jump spark system as in all the Syracuse models. This engine will be installed in the fast racer that the Syracuse company is building for the Peoria races, to be held early in July. Mr. E. J. Paradis, general manager of the company, will drive her.

The Oakland 20-32.

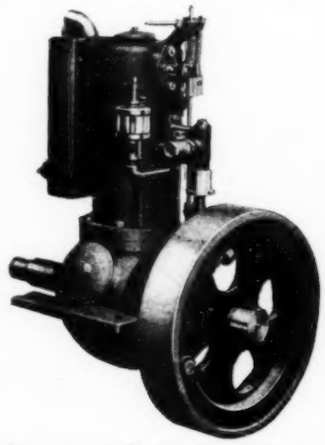
The engine which is shown in the accompanying photograph is manufactured for the Wilpen Company, of Detroit, Mich., by the Seager Engine Works, of Lansing, Mich. It is styled the Oakland 20-32 and since it is the only model of marine engine placed upon the market by the Wilpen Company, all their efforts have been combined toward making the engine as nearly perfect as possible. The engine was designed by A. P. Brush, designer of the Cadillac, Oakland, Brush Runabout, and other automobile engines, who is chief engineer of the Wilpen Company.



The Oakland 20-32.

The Cooley Dory Engine.

This 5 horsepower, single cylinder engine of the Cooley Manufacturing Company is the one recommended for use in the dory turned out by the same company. It is of the reversing type and will run equally well in either direction. Either make and break or jump spark ignition may be had. Special consideration has been given in the design of all parts of these engines to insure durability. They are built for hard, continuous work and the simplicity of the engine as a whole is apparent at a glance. The carbureter is entirely automatic, furnishing an even mixture of gas at all speeds and has an attachment which makes it a convenient throttle valve. The muffler is shown on the back of the cylinder

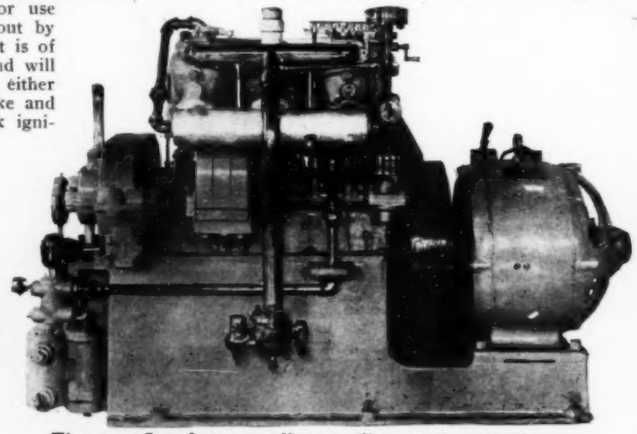


The 5-horse Cooley, for dory use.

and is water cooled. By this arrangement is eliminated the hot muffler usually found in the locker or under stern deck.

Auxiliary and Generating Set.

This is a recent addition to the Speedway line manufactured by the Gas Engine and Power Company and Charles L. Seabury and Company, Consolidated, and was designed to drive a generator for lighting purposes, an air compressor to store air for starting and reversing the engine and a plunger pump for fire and bilge service. The engine is of the 3 cylinder vertical type, 4½ inch bore by 5 inch stroke mounted on a cast iron frame which in turn is bolted to a bed with extension for the 3 K. W. generator. The two end cylinders are power cylinders, while the center one is an air compressor, with mechanically operated intake valve. This valve is so arranged that it may be lifted from its seat by means of a lever, when not required. On the end opposite the generator is the double acting bilge pump 4 inches by 4 inches. This is driven from the crank shaft through a train of spur gears, one of which may be shifted in and out of mesh, so that the pump may be stopped or started while the engine is running. Two ignition systems are supplied, the jump spark, the timer on vertical shaft together with magnetic plug and magneto. The normal speed of the engine is 800 R. P. M.



The new Speedway gasoline auxiliary and generating set.

New Things for Motor Boatmen.

New Attachments and Accessories That are Offered to the Man With a Boat. The Month's Production of Devices Designed as Aids to Motor Boating.

[Under this heading will appear each month descriptions and, whenever possible, illustrations of the various devices designed to add to the pleasure and comfort of motor boating which have been brought out since the previous issue. It should be kept in mind that the department in any one issue is, as it were, only one month's instalment of the many useful things on the market, and that it will be well to consult the previous issues of MOTOR BOATING which will form, together, a very complete illustrated directory of the things the motor boatman needs. —In writing the makers of the articles shown, if our readers will mention MOTOR BOATING, they will receive special attention.]

Fig. 1. — Muskegon Spark Coil.

Muskegon Spark Coil (Fig. 1).—Muskegon Coil Co., Muskegon, Mich. The coil shown in tne accompanying cut has a brass case with an oxidized finish and is said to be practically indestructible. This type is so designed tnat it can be bolted directly to the cylinder head and is made for either jump spark or make-and-break ignition. A metal cap fits over the vibrator and the total height of the instrument is 7½ inches, with a diameter of 2¾ inches. It is made for one, two, three or four cylinders, and may be furnished with a bottom outlet if desired in place of the outlet shown in the illustration.

* * *

Fig. 2.—Star Bilge Pump.

Star Bilge Pump (Fig. 2).—W. and J. Tiebout, 118 Chambers St., New York. This compact and strong bilge pump is built along the same lines as the Star Air Pumps, and is operated by a cam adjustment to the shaft. The small size of the pump makes it very useful in boats of small size inasmuch as the complete apparatus can be operated in a space measuring 10 inches and the space required upon the shaft is but 3½ inches. It can be placed upon either side of the shaft and since the cam is split it can be easily attached without uncoupling the shaft. The pump is made in two styles, an iron body with brass cylinder and plunger selling for $15 and an all brass instrument selling for $18, including a brass strainer for the intake end.

* * *

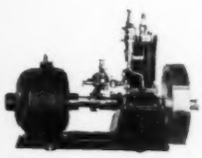


Fig. 3. — Richardson Generating Set.

Richardson Generating Set (Fig. 3).—Richardson Engineering Co., Hartford, Conn. These electric generating units are direct connected and furnish an ideal electric lighting system for cruisers of all sizes. The sets are built very accurately and carefully, and with the two-cycle engine fitted with jump spark ignition are very smooth running and quiet in operation. They are made in three sizes and are easily governed. The unit shown herewith is fitted with a 1 H. P. single cylinder Brown engine and is of 8 light, 4 ampere capacity; the other two sizes are fitted with two-cylinder, 2 and 3 H. P. engines respectively, and have a capacity of 16 lights, 8 amperes, and 26 lights, 13 amperes. The smallest outfit weighs 200 pounds and the largest 450 pounds.

* * *

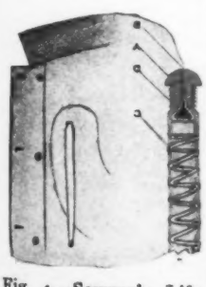


Fig. 4.—Sawyer's Life Saving Garment.

Sawyer's Life Saving Garments (Fig. 4).—H. M. Sawyer and Son, East Cambridge, Mass. These garments, which are given the name of Life Buoy Oilers, as may be seen from the illustration, are provided with air chambers which may be inflated, causing the garments to act as individual life preservers. A slight amount of air in the chambers is sufficient to keep a person afloat, and since the rubber tube is provided with a check valve it can be easily inflated. A flexible spiral wire inside of the tube keeps it from collapsing and to let out all the air it is only necessary to press in upon the end of the valve stem. These garments are made for both men and women and vary in price from $2 to $5, according to the style.

* * *

Fig. 5.—The Carborundum Outfit.

Carborundum Valve Grinding Compound (Fig. 5).—The Carborundum Company, Niagara Falls, N. Y. The valve grinding compound manufactured by this company is composed of Carborundum powders and a high grade of grease, put up in collapsible tubes. This is made in two grades, one coarse, for the first rough grinding, and the other containing a fine mixture for finishing. The Carborundum powders of which this mixture is composed, are hard, sharp and quick cutting and produce a true contact seat. The outfit shown in the illustration, containing two collapsible tubes of the compound, Carborundum cloth strips, etc., sells for 75 cents, and another outfit containing two half-pound tins of coarse and fine grain, cloth strips, etc., sells for the same price.

Blue Blaze Spark Plug Terminals (Fig. 6).—The National Steel Products Company, Lorain, O. Instead of the ordinary thumb nut usually supplied with spark plugs, and which is more or less likely to work loose, Blue Blaze plugs are now supplied with a new and very convenient terminal as shown in the illustration. No tools are required to attach the ignition cable to this terminal, and when it is once attached the spring holds the cable firmly. This new device is made to fit all standard plugs, and is sold for 25c.

* * *

Fig. 6.—Blue Blaze Spark Plug Terminal.

Phelps Trouble Finder.—New England Sales Company, 454 Old South Building, Boston. Since describing this instrument in the April issue of this magazine, an improvement has been embodied in the construction which permits a motor to be throttled down to its extreme limit. The construction of the Bosch Magneto is such that it was impossible to throttle down to such low speeds when using this instrument; but the points of the trouble finder are now placed much closer together, thereby remedying the fault.

* * *

Fig. 7. — Hagstrom Spark Plug Hand Vise.

Hagstrom Spark Plug Hand Vise (Fig. 7).—Hagstrom Bros. Mfg. Co., Inc., Lindsborg, Kas. As will be noticed from the illustration this hand vise will be found most convenient for use in cleaning spark plugs and is very simple in its operation. The jaws of the instrument are threaded to fit the threads on the plug, and can therefore be used also for straightening the threads on plugs which have become dented through careless handling.

* * *

Fig. 8.—Acme Electric Switch

Acme Electric Switches (Figs. 8 and 9).—Acme Motor Parts Co., Lafayette, Ind. These switches are made of a high grade of rubber, having a strong base, a phosphor bronze lever, heavy contacts and a rubber button upon the lever. The lever can be easily removed, and therefore serves also as a key to prevent tampering with the ignition system. All metal parts are nickel-plated, and the article presents a very handsome and neat appearance. The diameter of the base over all is 2 inches, and the height to the top of the button 1 1-16 inches. The switches are made in two styles, for either front or back wiring, and sell for 50c. each with special discounts for quantities.

* * *

Fig. 9.—Acme Switch for front wiring.

Crockett's Paints.—The David B. Crockett Company, Bridgeport, Conn. Although Crockett Paints have been upon the market since 1868, three varieties for marine use will be of interest to motor boatmen. The first of these is a spar composition which is said to be positively salt and fresh water proof and will not spot, crack, blister or scale. The spar one-coat finish is made on the same general principles as the spar composition but will be found useful in cases where work must be rushed, inasmuch as it will dry much more quickly. A standard interior varnish is known as No. 1 Preservative which can be washed with hot or cold water and soap without any danger of being marred or scratched.

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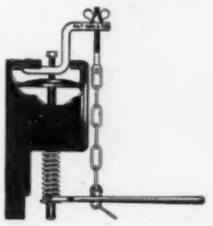

Fig. 10. — Peterson Valve Spring Lifter.

Peterson Valve Spring Lifter (Fig. 10).—Peterson Valve Tool Co., South Bend, Ind. This article is designed for the purpose of removing valve springs by means of a straight lift which will not bend the valve stem or allow the spring to slip off. A great leverage is furnished by the handle shown in the accompanying illustration, and it is stated that it will make the stiffest valve spring lift with ease, at the same time holding down the valve. The instrument is adjustable to any motor, and is made of steel with a finish of nickel plate. The price of the device, enclosed in a neat leather bag, is $2.

Fig. 11.—Breech Block Plug.

Breech Block Plug (Figs. 11 and 12).—Earl Canedy, 33 West St., Chicago Heights, Ill. These plugs, as will be noted from the illustrations, have chambered ends which keep soot and oil from the porcelain and prevent the engine from mis-firing. In the mica plugs, the most perfect mica cores obtainable are used, and it is stated that after a year's service they show absolutely no leakage between the center rod and the outer shell. The sectional view shows the construction of both the mica and porcelain plugs. These plugs can be inserted in three different positions, permitting the handles to all point alike when tight and the plug can easily be opened with a quarter turn of the handle for purposes of cleaning. All Breech Blocks are interchangable and are made in the regular threads. The porcelain plug sells for $1.50, and the mica plug for $1.75.

* * *

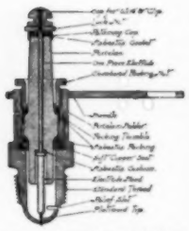

Fig. 12.—Sectional View of Breech Block Plug.

Jeffery's Marine Glue.—L. W. Ferdinand & Co., 201 South St., Boston. This marine glue is waterproof and possesses the peculiar properties of flexibility and durability, and even though it becomes soft and pliant under heat it still retains its adhesion to timber, fiber, etc. It is insoluble in water and is exceptionally clean in its use. This glue may be used for a number of purposes, such as caulking and paying decks, waterproofing canvas, etc., and is very easy to apply. It is made in several colors and qualities, varying in price from twenty to thirty cents per pound, with lower prices for large quantities.

* * *

Fig. 13.—Broga Automatic Fastener.

Broga Automatic Fasteners (Fig. 13).—Broga Automatic Fastener Co., Syracuse, N. Y. These fasteners present an entirely new feature in fastening curtains on a boat of any size. They are so constructed that they may be installed flush with the coaming of the boat so that there is no projection to be knocked off or damaged. The stud that fastens to the curtain has twin washers, one for either side, distributing the fastening surface and preventing the fasteners from pulling out. The illustrations show their operation. The list price of the fasteners in dull brass finish is $1.50 per dozen, and in polished brass $1.55 per dozen.

* * *

Fig. 14.—Gyrex, The Mixer.

Gyrex, The Mixer (Fig. 14).—Gyrex Manufacturing Co., 1777 Broadway, New York. This device is designed to insure complete vaporization and thorough mixture of the fuel in an internal combustion engine. As the illustration shows, it consists of a fan with perforated blades mounted in a flanged shell which is inserted into the union between the carbureter and the base of the inlet manifold. The mixture causes the fan to revolve at high speed, and the saw-toothed edges and perforations of the blades heat the spray and thoroughly diffuse it. The fan is made of annealed copper, with ball bearings, fully enclosed. The instrument is made in all sizes and sells for $3.

* * *

Fig. 15.—Yeager Grease Gun.

Yeager Grease Gun (Fig. 15).—Busse Machine Works, 41-43 Marion St., Brooklyn. This gun, which has just been placed upon the market, consists of an outer shell and an inner shell, as may be seen from the cuts. To fill the gun it is only necessary to pull the handle out and turn it three or four turns to the left, when the inner shell may be removed. The instrument may then be plunged into the grease, the handle turned back again, thereby covering the vent hole in the top, and the gun will be filled. The instruments are made in a simple and practical manner and are exceedingly clean to operate. They may be secured from all jobbers at $3 each.

* * *

Fig. 16.—Champaign Weedless Reversible Propeller.

Champaign Weedless Reversible Propeller (Fig. 16).—Champaign Bros., Ithaca, N. Y. These wheels are made from the best quality of phosphor bronze and since they have a perfectly flush hub, with no projections or holes, no weeds or dirt can catch in them. The weedless feature of this wheel lies in the elliptical shape of the hub and the same principle operates as when a string is wound upon a prolate spheroid. The weeds have a continual tendency to slide off the wheel. There are no screws or fastenings which can possibly work loose, but by removing a cotter kev and three screws a blade may be removed and a new one substituted. The illustration shows the wheel with working parts separated.

Bosch Battery System (Figs. 17 and 18).—Bosch Magneto Co., 223 West 46th St., New York City. To supply the demand for two completely independent ignition systems this company has brought out the combined timer and distributer and the synchronous coil, shown in the accompanying illustrations, for use with any of the standard Bosch magnetos. The coil is contained in a housing with removable ends, and the switch handle is designed to be used as a kick switch which can be locked only when the switch is in the off position. The combined timer and distributer is very small and compact. Of the secondary contacts on the top the outer ones are for the spark plug connections, while the one in the center is the terminal at which the secondary current is received and passed to the distributor.

* * *

Fig. 17.—Synchronous Coil Used in Bosch Battery System.

Fig. 18.—Bosch Combined Timer and Distributor.

Reeder Fifteen Dollar Hull.—J. F. Reeder, naval architect, Broad and Chestnut Streets, Philadelphia. This boat, similar to Minnow, the champion motor boat of Sunapee Lake, N. H., will carry eight persons comfortably and is of the V-bottom type. The length over all is 17 feet, beam, 4 feet, and the speed 14.7 miles per hour. It is stated that any one without any experience can build the hull ready to launch, in spare time, at a cost of $15. Paper patterns, blue prints and illustrated instructions are furnished and everything ready to commence the construction of the boat, with ten consultation blanks, is being sent for $2.

* * *

Ideal High Tension and Adjustable Gap Spark Plugs (Fig. 19.) Ideal Switch Company, Inc., Plainville, Conn. These plugs are rust, soot and heat proof and have a special feature in the center electrode which is tightened and held in place by check nuts, an arrangement which prevents any possibility of leakage. The plug shown in the accompanying illustration is used for a high tension circuit and the other model is made with an adjustable spark gap. Both plugs have a beveled seat for gasket, insuring a tight joint. In the adjustable gap spark plug, the gap may be so adjusted as to give best results by turning the porcelain by means of the adjusting nut. This can be done while the plug is in the cylinder and the adjustment is shown by arrows on the base of the plug and on the porcelain. When these arrows are in line the gap is as short as possible and this is increased by turning the adjusting nut in either direction. When the gap is set in the desired position it can be easily tightened and locked. The high tension plug sells for $1 and the adjustable gap plug for $1.50.

* * *

Fig. 19.—Ideal High Tension Spark Plug.

Remy High Tension Magneto (Fig. 20).—Remy Electric Company, Anderson, Ind. Two magnetos recently brought out by this company are type S shown herewith, which is intended for high powered motors, of two, four or six cylinders, and type T, suitable for light powered motors of either two or four cylinder design. The latter is similar to type S, except that it has four permanent magnets in two pairs instead of six, set in three pairs. This magneto has a stationary winding, thereby eliminating revolving wires, moving contacts, etc., and the timing of the spark is accomplished by shifting the circuit breaker around the inductor shaft, to which is attached the circuit breaker cam. A special step-up transformer coil furnished with the magneto is fitted with a two point switch used to change from battery to magneto or vice versa or to disconnect from either to stop the motor. A push button is also provided for starting and the system makes starting without crank most reliable. When batteries are used in connection with this magneto, the battery current is simply turned through the coil and distributed of the magneto instead of the magneto current.

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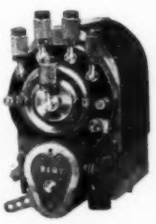


Fig. 20.—Remy High Tension Magneto Type S.

Disappearing Hingeless Door (Figs. 21 and 22).—Cape Cod Power Dory Company, Wareham, Mass. As will be seen from the illustration, this cabin door is made in one piece and is made to close the front of the cabin without the use of hinges. It is simple in operation and to open the cabin it is only necessary to push back the regular cabin slide, take the cabin door by the handle at the bottom, raise it about an inch, then carry it upward and forward to a horizontal position when it may be pushed back under the regular cabin slide. These doors, in addition to the advantage of being hingeless do not easily get out of adjustment and are never in the way. The price is $10 complete, for ordinary sizes.

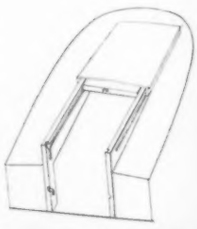


Fig. 21.—Disappearing Hingeless Door.

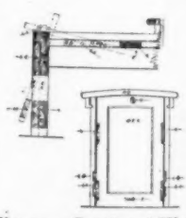
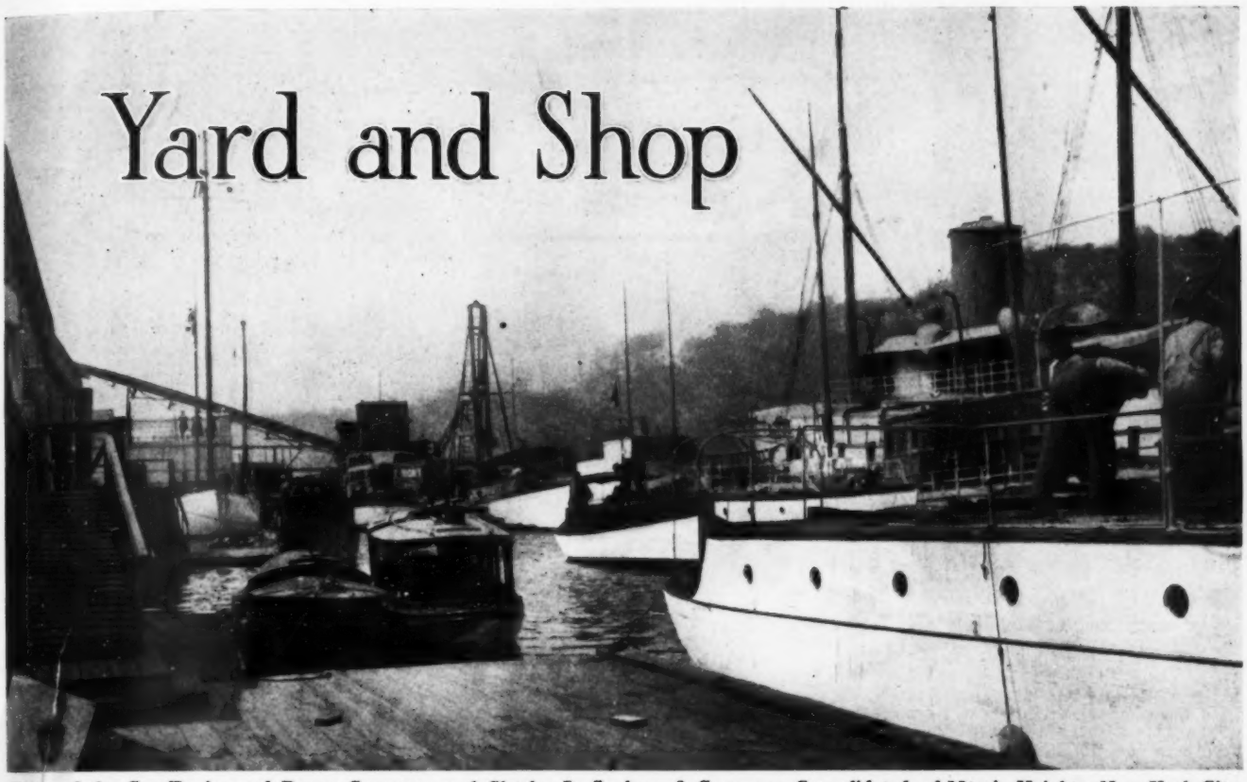


Fig. 22.—Sectional View of Hingeless Door.

Yard and Shop



Plant of the Gas Engine and Power Company, and Charles L. Seabury & Company, Consolidated, of Morris Heights, New York City.

The **Electric Goods Manufacturing Company,** of Canton, Massachusetts, has issued an announcement offering to distribute to motor boat clubs fifty challenge cups as prizes in case any ignition system in the world will spark with its induction coil and spark plug completely submerged as long as will the Perfex Ignition. This offer is to hold good for a period of thirty days from date of May 9th and is open to all jump spark ignition systems.

Heather, the winner in last year's race from Bermuda to New York, belonging to Mr. Richmond Levering, Cincinnati, has recently been fitted with an 18½-foot Gurnet as a tender. The boat is equipped with horse power Atlantic engine and is attractively fitted.

The Vivax Storage Battery Company, of 2228 Michigan Boulevard, Chicago, has succeeded to the manufacture of the Duro line of storage batteries, formerly manufactured by the Chicago Battery Company. A plan has been accepted to amalgamate the Duro and Vivax factories under one roof and management, and Mr. H. W. Beek, Manager of the Vivax Company, is expecting to produce excellent results through the union of the two companies.

The R. L. Kenyon Company, Inc., of Waukesha, Wisconsin, owing to a typographical error on page 49 of the May issue of MoToR BoatinG, received credit for shipping a carload of their tops to the value of $1,200 to the W. H. Mullins Company. The value of this carload was $12,000.

The National Gas and Gasoline Engine Trades Association will hold their semi-annual meeting at the Sinton Hotel, Cincinnati, June 13th to 16th, inclusive. A number of well-known manufacturers will speak upon the various phases of gasoline engine construction and unusual opportunity will be given for discussion. An exhibition of parts and accessories will be shown in the Exhibition Hall, adjoining the Convention Hall.

The Ferro Machine and Foundry Company, of Cleveland, Ohio, who have recently formed the Ferro Club for the promotion of the sport of motor boating, have had an unusual amount of success with their craft in South African waters. At Durbin, Natal, South Africa, where the Durbin Motor Boat Association holds monthly races, a handsome silver cup was awarded recently to the owner of a Ferro launch, which won a race in competition with other boats of various lengths and powers.

The Trimount Rotary Power Company, of Boston, have removed their offices and warerooms to 144 Pearl Street from 106 Summer Street.

The Auto Force Ventilating System, of 53 Devonshire Street, Boston, have opened an office in Montreal at 505 Power Building. Messrs. Gardner and Gaskill (A. M. Can. Soc. C. E.) are the sole Canadian licensees and manufacturers.

The S. and V. Motor Company is a new Brooklyn corporation with a capital of $10,000, organized to manufacture and deal in all parts of motor boats.

The Loveland Manufacturing Company, of 17 Atlantic Street, Bridgeton, New Jersey, is a newly incorporated concern, having a capital of $15,000. An increased amount of business has made it necessary to incorporate and obtain more capital and the company expect to greatly increase their output.

The Elbridge Engine Company, of Rochester, New York, owing to the recent successful production of light weight engines, are anticipating an unusually busy season for their speed testing department. It is expected that at least half a dozen fast speeders, several of which it is believed will break all existing records, will be tested out in the early summer months. The Elbridge featherweight engine has been developed until it is now placed upon the market in aeroplane models and is reported to be meeting with an unusual sale.

The Niagara Gasoline Motor Company of Buffalo, recently organized to carry on the business on the Ducro Manufacturing Company, have moved into a large factory and greatly increased the output of Niagara motors.

The Carlyle Johnson Machine Company of Manchester, Connecticut, have recently shipped a number of their well-known clutches for use upon aeroplanes. Of the latest shipments for this purpose one clutch was sent to the Johnstown Aero Company of Johnstown, Pennsylvania, where it is to be used in an aeroplane equipped with a 36-horse power motor, and two small clutches to the Auto and Aeronautic Supply Company, 2100 Broadway, New York City, for use in aeroplanes.

T. F. W. Meyer, of Bolton Landing, New York, has been appointed direct factory representative for Ferro engines, reverse gears and accessories for the territory surrounding Lake George. Mr. Meyer has also taken the agency for the Auto Craft line of boats.

The Motor Boat and Water Carnival Association of New York recently incorporated with a capital of $2,400 for purposes of general advertising business and the promotion of motor boat shows.

The Termaat & Monahan Company, of Oshkosh, Wis., report that they have greatly increased their export business within the past two years through their foreign office at 20 Produce Exchange, New York. It is stated that the mayor of one of the large cities in Europe purchased a 60-horse power engine from them and that the same model is being used on the Great Lakes and the Panama Canal by the United States Government.

Charles H. Priest is now the state representative of the Fairbanks Company for Maryland, stationed at Baltimore.

Baltimore, Maryland, reports unusual activity in the motor boating field for the present season and it is stated that there will be a large business done in heavy duty motors, especially among the oystermen. The yards of the Nilson Shipbuilding Company, C. Durm and Son, and M. M. Davis and Son are busy with orders for new craft.

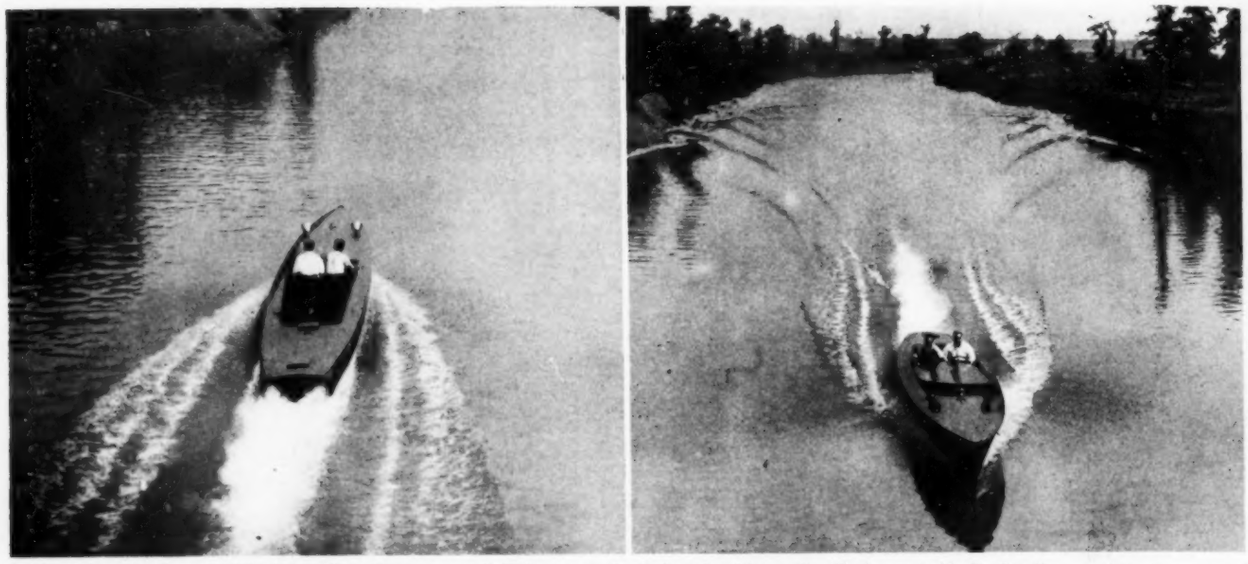
The Syracuse Gas Engine Company, of Syracuse, N. Y., have entered a new speed boat equipped with their "Big Six" engine in the races of the Mississippi Valley Power Boat Association to be held on Peoria Lake, Peoria, Ill., July 4, 5, and 6. The boat is entered in the free-for-all and in the 32-foot class races and is expected to show considerable speed.

Export Sales Recorded.

Following are shipments made to foreign shores by American manufacturers during the past month:

Waterman Marine Motor Company, Detroit, Mich. Two complete Waterman Motor Canoes and 12 Waterman Marine Motors of different sizes and types to the Argentine Republic.

Anderson Engine Company, Shelbyville, Ill. One single, two double, and one three-cylinder marine engine to Brisbane, Australia. Three engines with complete marine equipment to Nykjobing, Denmark.



Catherine, built by the Weckler Boat Company, of Chicago, and equipped with an 8-cylinder, 100 H. P. Sterling engine, is expected to enter many races this summer.

The Remy Electric Company, of Anderson, India, have recently opened a branch distributing office at 214 Pleasant Street in the Motor Mart, Boston, which is in charge of M. H. Pearson, who has been transferred from the company's Kansas City branch. It is stated that over 125,000 Remy magnetos have been sold for delivery during the 1910 season.

The Economy Manufacturing Company, of Pittsburgh, Pa., have called our attention to the fact that the Automatic Battery Charger, which was described upon page 47 of the May issue of MOTOR BOATING, is intended primarily for charging the battery with lighting rather than with ignition current.

Theo. H. Marburg, import and commission dealer in Mea High Tension Magnetos and S. R. O. Ball Bearings, has removed from 59 Wall Street to 1777 Broadway, New York City.

Foreign Trade Opportunities.

Opening for American Motor Boats In Norway. Consul P. E. Taylor, of Stavanger, reports that there is an exceptional opportunity in Norway for the introduction of American motors and motor boats, and the opportunity is both for light fast craft and for heavy substantial boats for fishing purposes. There is a yacht club in Stavanger with 180 members and races are held annually; last year an American boat took first prize and this has given American motors some very good advertising. All correspondence should be in the Norwegian language, as few of those interested in the trade speak English. Competition is keen and a high standard of quality in boats and motors is required. A three to six months' credit is an absolutely essential factor in conducting such a business.

No. 4810. Motor Boats In Latin-American Countries. An American consul in a Latin-American country states that there is a splendid field for the sale of motor boats in his district. There are few motor boats there but they are all owned by the government. Several inquiries have been received by the consul for motor boat catalogs and he feels certain that some business can be done if the trouble is taken to go after it. He advises that correspondence in Spanish with catalogs be sent to him and additional catalogs are also requested for filing in the consulate.

Motor Boats in France. Motor boating has taken great strides in this country during the past few years and especially at Arcachon, where a colony of enthusiastic water sportsmen is continually on the alert for new types of boats and marine engines. The yacht club there has a membership of 306. While at present there are not many American motors, there is a large field for their introduction. The fishing fleet of this neighborhood offers many opportunities also and there is considerable demand for heavy duty engines of from 4 to 15 horsepower. The addresses necessary in introducing American goods in this neighborhood are on file at the Bureau of Manufacturers in Washington.

The Marine Engine in Canada. This is one of the largest fields for the introduction of the marine motor as fishermen in this district are rapidly becoming acquainted with its advantages. Consul Frank Deedmeyer, of Charlottetown, has directed attention to this and advises American manufacturers to enter the field, especially in the vicinity of Nova Scotia, New Brunswick, and Prince Edward Island, where the fishing fleet numbers over 26,000 boats.

National Association of Engine and Boat Manufacturers. Supplementing the information sent out by Consul P. E. Taylor, of Stavanger, Norway, this association gives the following names of firms in that town who would doubtless be interested in the introduction of American motors: Thorstein Bryne, Carl E. Buch, C. Borgen, Agent, and Jacob J. Helvig. Correspondence should be in the Norwegian language if possible.

Motor Boats in Porto Rico. The Porto Rico Association, San Juan, Porto Rico, is sending out information regarding the island as a field for motor boating, and states that there are many miles of open ways of salt and fresh water on ocean, sea, lake, langua and river. The fishing is excellent and the delightful climate makes motor boating very enjoyable. More information can be secured by addressing the Association.

Fitting Out For a Cruise.

(Continued from page 10.)

lying alongside of a dock or vessel. The canvas kind filled with cork shavings are efficient and probably the best.

Life preservers and a ring buoy are nowadays to be found on board nearly every cruiser. Have them where they can be readily found if needed.

A drogue or sea-anchor should be carried if much outside sailing is to be indulged in.

A tender light enough to pull into the cockpit when making long runs in rough water is desirable unless your craft is large enough to carry a boat on davits.

The galley on a small cruiser should be equipped for service. Fragile cooking utensils have no place on board such a craft. Agate ware is the thing. The stove had best be a Shipmate, burning coal or wood, since this stove is a most cheerful companion early or late in the season when there is a decided chill in the air at night, particularly here on our Maine coast. No other stove is at all useful for drying out wet garments or damp bedding in rainy or foggy weather. The only difficulty is that the usual layout of our small cruisers below decks allows of little space for anything but a blue flame or alcohol stove on a shelf in some odd corner.

The table dishes may be attractive but should not be thin or easily nicked. The tumblers should be heavy also. Dish and tumbler racks are a great help in preventing breakage.

The stores should be kept in ventilated lockers or a good refrigerator, according to their nature. The water tank should be large and tinned inside with a faucet in the galley space. Of course a built-in sink is a most desirable fixture.

In laying in provisions for a cruise aim at variety and choose articles that do not deteriorate quickly. It is difficult to give a definite list since tastes vary so greatly, and of course quantity is dependent upon the size of the ship's company, and the length of the cruise. Canned goods and preserves in glass are now entirely to be depended upon and with the staples which may be carried from home and fresh fish, meats and vegetables which may may be picked up at ports along the way the cuisine can be made most attractive.

I give below a list which may prove helpful:

Tea, coffee, granulated sugar, cut loaf sugar, cocoa, pepper, salt, vinegar, mustard, milk (condensed), butter, pilot bread, cheese, fancy crackers, soda crackers, pickles, catsup, ham (to fry), salad dressing, canned chicken, bacon, chipped beef, oranges, bananas, lemons, potatoes, onions, eggs, ginger ale, Poland water, bread, cake, smoked salmon, Campbell's soups, sardines, canned tomatoes, canned succotash, canned peas, canned lima beans, canned corn, canned tongue, canned roast beef, canned baked beans, canned luncheon sausage, potted chicken, shredded codfish, veal loaf (in tin), orange marmalade, canned peaches, peanut butter, apple jelly, milk chocolate, Nabisco wafers, "Reliable" prepared flour, corn meal, cream of wheat, corn flakes, ice, water, kerosene, candles, matches.

There would of course be many little things in the culinary department not included above, such as soap, washing powder, stove polish, etc., which should be looked after, but which would probably be on board.

Matches should be carried in a glass jar with screw top and rubber ring.

If possible get your stores on board the day before leaving so as to be able to check up the list and find out if anything has been omitted.

Get an early start in the morning and come to anchor before dark. If a place suits you do not hurry on but lie there a day or two and enjoy it. Don't start out on a day when the coasters are flocking into port, even if your boat is a real sea boat. There are chances enough to prove your quality when caught out by accident.

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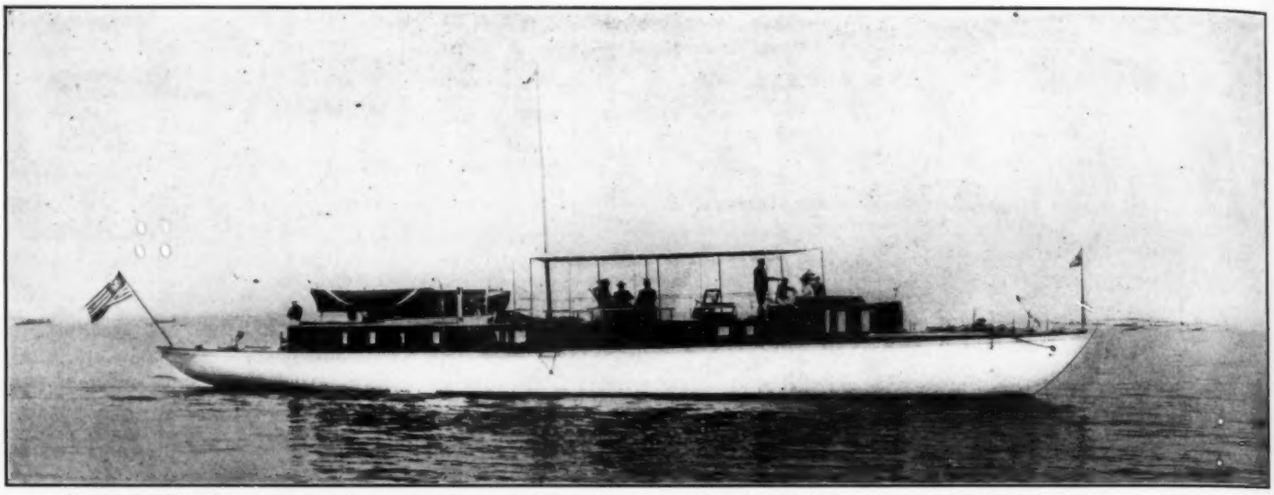
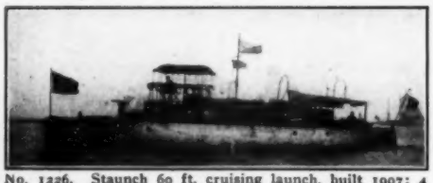


No. 1354.—Able and roomy 93 ft. twin-screw launch, recently built under my supervision by first-class builders; two 60 H.P. Craig engines. Low figure.
Please mention MOTOR BOATING.

No. 1238.—Exceptionally roomy gasolene yacht, 125x20x6, three engines and propellers, speed 15 miles. Belongs to an estate.
Please mention MOTOR BOATING.

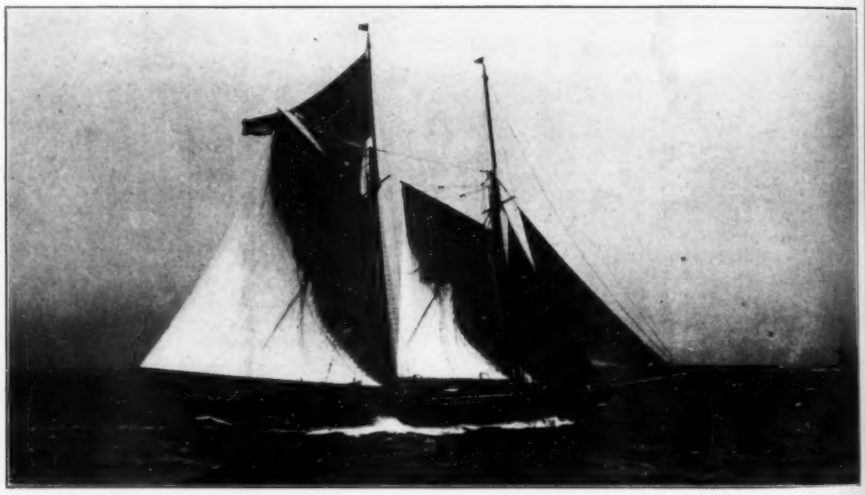
No. 1544.—Modern cruiser, 53 ft. x 11; built 1907; excellent motor.
Please mention MOTOR BOATING.



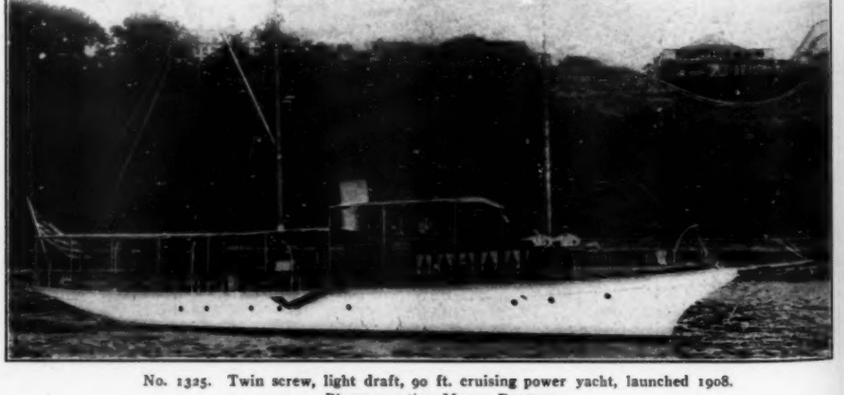
No. 1226. Staunch 60 ft. cruising launch, built 1907; 4 cylinder engine, speed 14 miles. Offer desired.

No. 1335.—Twin screw launch, 75x17; built 1908; two first-class 40 H.P. motors.

No. 441.—Commodious, twin screw house-boat, 85x23.6x4; built 1906; two 70 H.P. engines.



No. 1499.—Bargain. Handsome, modern auxiliary schooner, recent build, offered by an estate; 110' over all, 24' beam, 6' 6" draft; 4 staterooms, saloon, breakfast room, bath, etc.; 60 horse power engine; practically in commission; no reasonable offer refused.
Please mention MOTOR BOATING.



No. 1325. Twin screw, light draft, 90 ft. cruising power yacht, launched 1908.
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No. 24. 23 ft. x 5 ft.; 14 H. P. Mercury motor; speed 15 miles. White cedar planking; mahogany decks.
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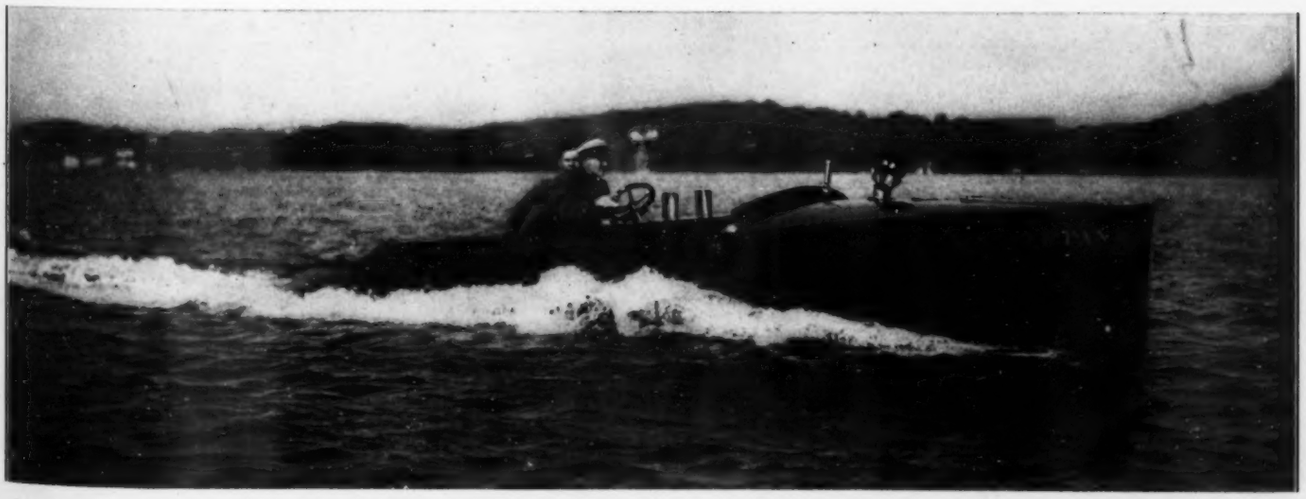
No. 27. 21 ft. x 4 ft. 8 in; 6 H. P. Mercury; speed 11 miles.
Please mention MOTOR BOATING.

No. 37. Trunk cabin cruiser Playfellow, 36 ft. x 8 ft.; 30 H. P. 4-cycle motor; fully equipped; perfect condition; all mahogany finish. GREAT BARGAIN.
Please mention MOTOR BOATING.



No. 31. Famous Peter II. All mahogany. 28 ft. x 4 ft. 2 in. Capacity eight passengers. Speed 24 miles.
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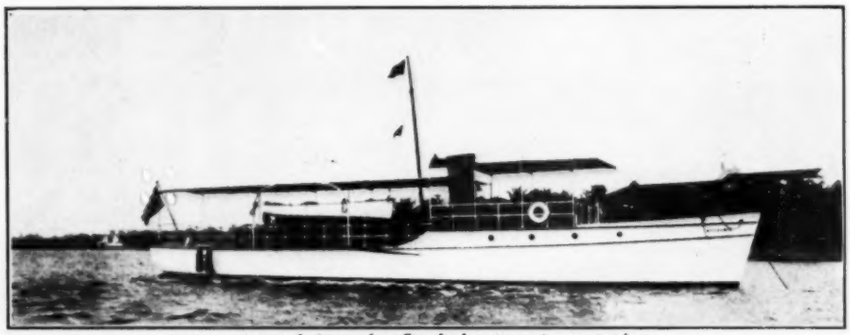
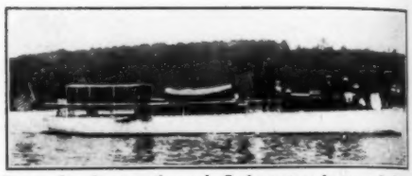
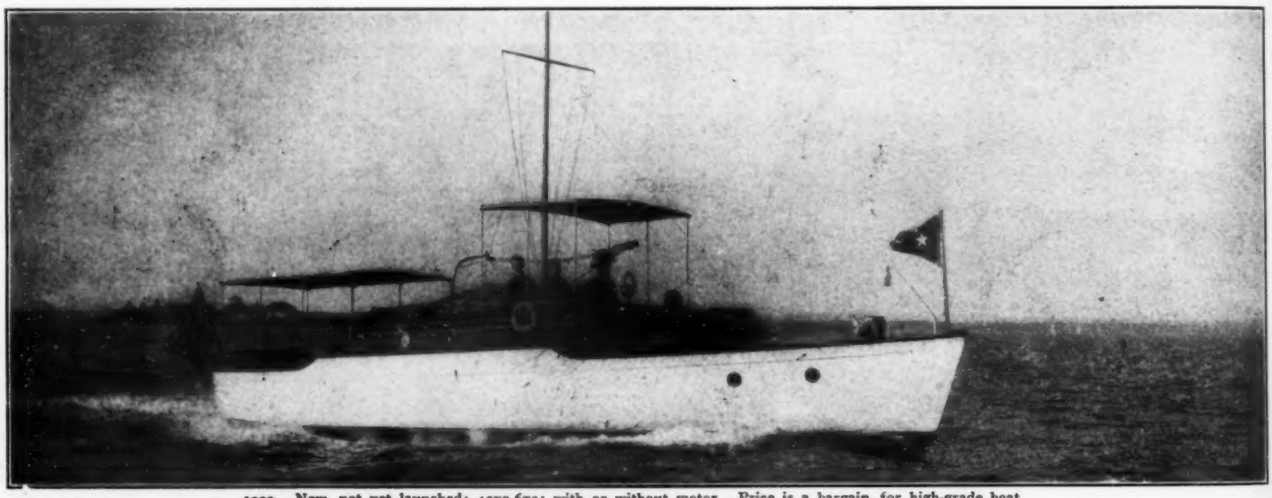


7010. 70x13.3x3.6; two 25-h.p. Standard motors. In commission.
Please mention MOTOR BOATING.

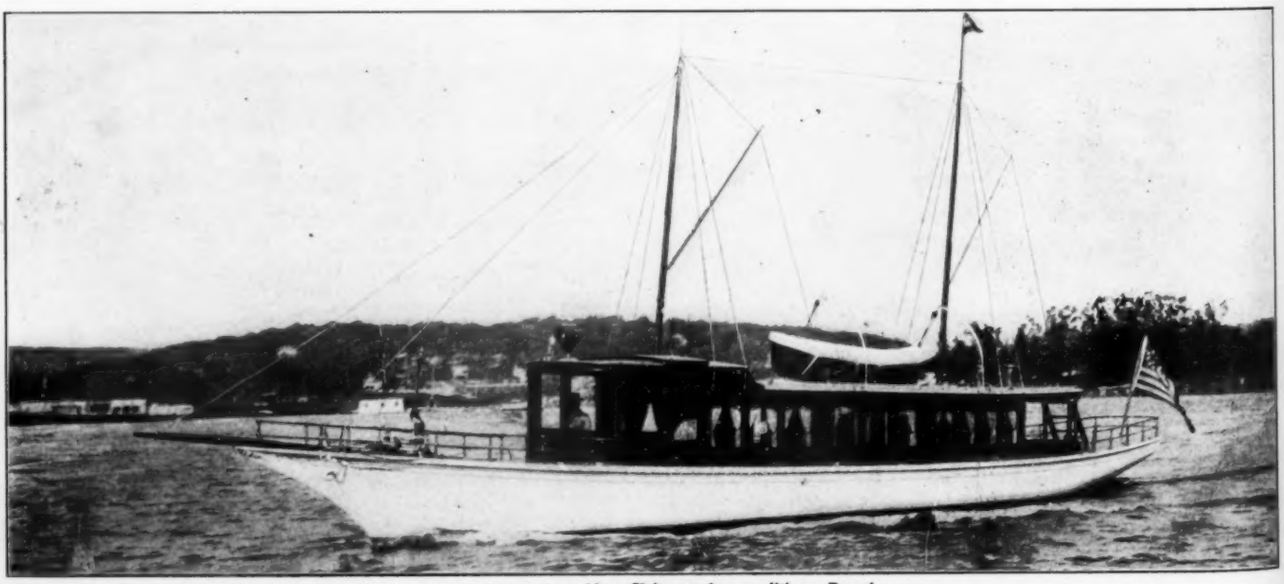
563. 35x8.10x2.6; 18-h.p. Palmer; excellent condition; good inventory; price low.
Please mention MOTOR BOATING.



6201. 61x56x10.3x2.6; 4-cyl. Craig motor; in commission.
Please mention MOTOR BOATING.



1000. New, not yet launched; 42x9.6x3; with or without motor. Price is a bargain for high-grade boat.
Please mention MOTOR BOATING.



9204. 50x45x11x3; 16-h.p. Globe; perfect condition. Bargain.
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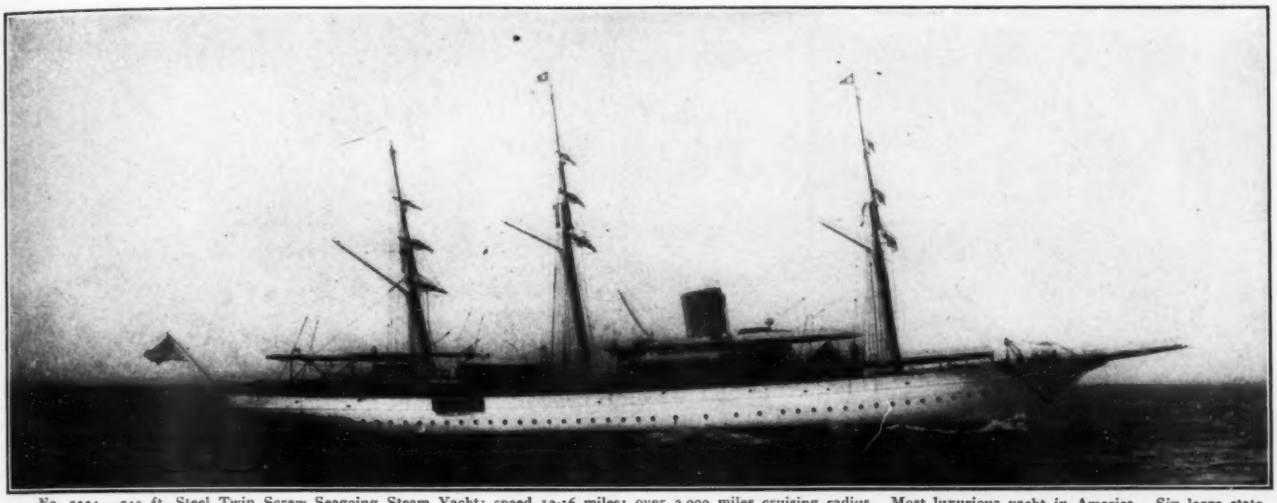
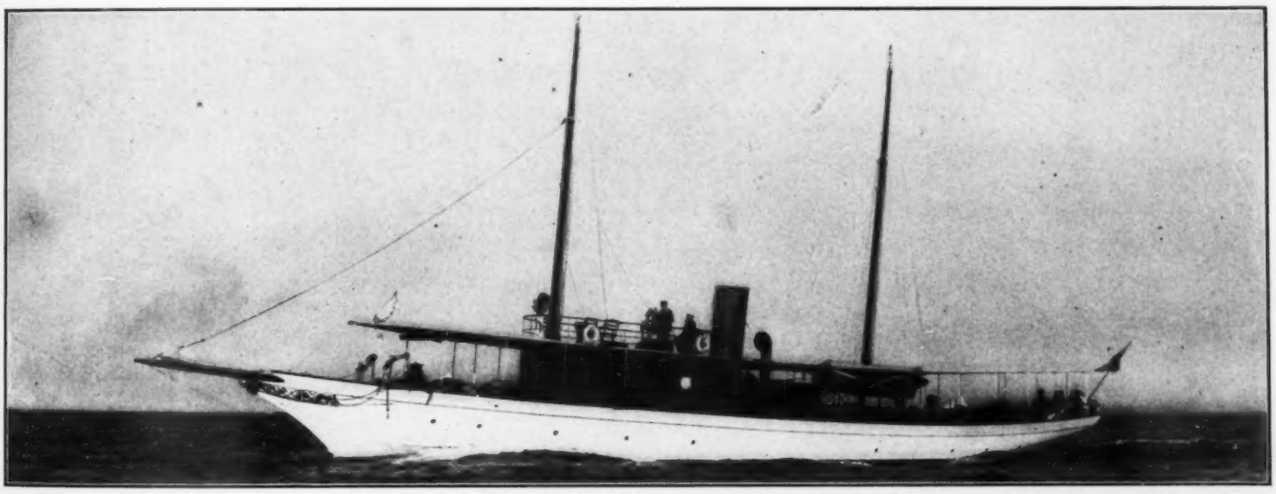
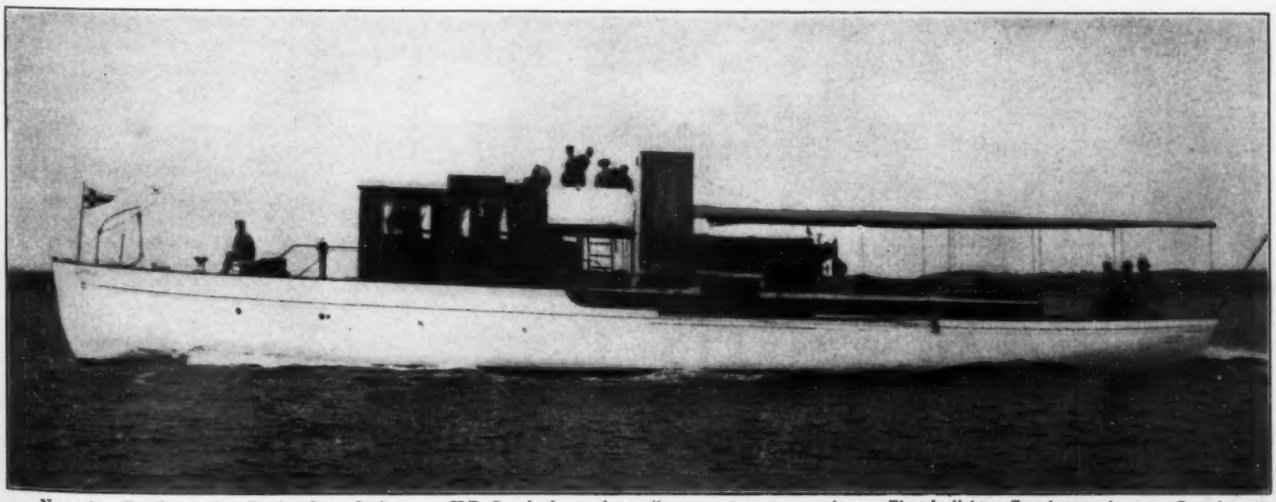


No. 5334.—243 ft. Steel Twin Screw Seagoing Steam Yacht; speed 13-16 miles; over 3,000 miles cruising radius. Most luxurious yacht in America. Six large staterooms; 3 baths; 3 saloons in hand-carved mahogany and tapestry. Steam laundry. Electric lights; steam heat. Ice machine. In perfect condition. Engines and boilers only used on trial trip. Suitable auxiliary Naval Vessel. Price, one-fifth of cost. Apply to Stanley M. Seaman.



No. 5144.—Wooden Steam Yacht, 117 ft.; built 1907; 4 staterooms; 2 baths; large deck dining saloon; Sullivan triple engine; speed 12 knots; completely equipped; maintained more economically than gasolene same size and speed. Price very low; owner building one larger. Condition warranted by Stanley M. Seaman.



No. 5967.—Gasoline 80 foot Lawley Coast Cruiser; 100 H.P. Standard; speed 13 miles; 2 staterooms; 2 saloons. Electric lights. Complete equipment. Cost $21,000. Bargain. Condition guaranteed by Stanley M. Seaman, 220 Broadway, New York City.

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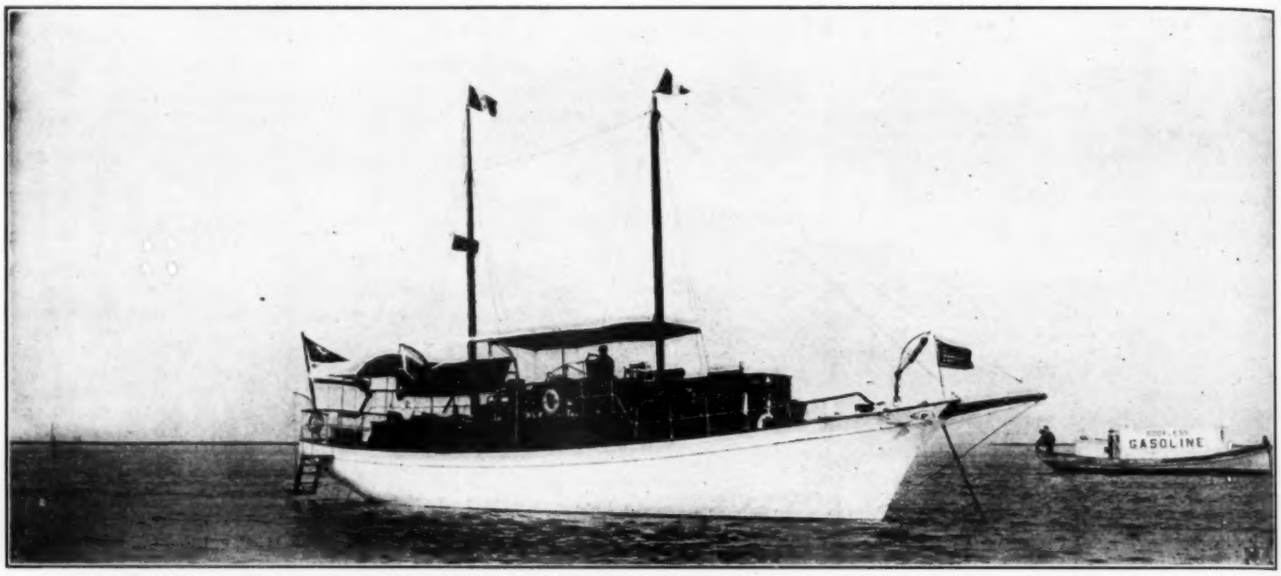
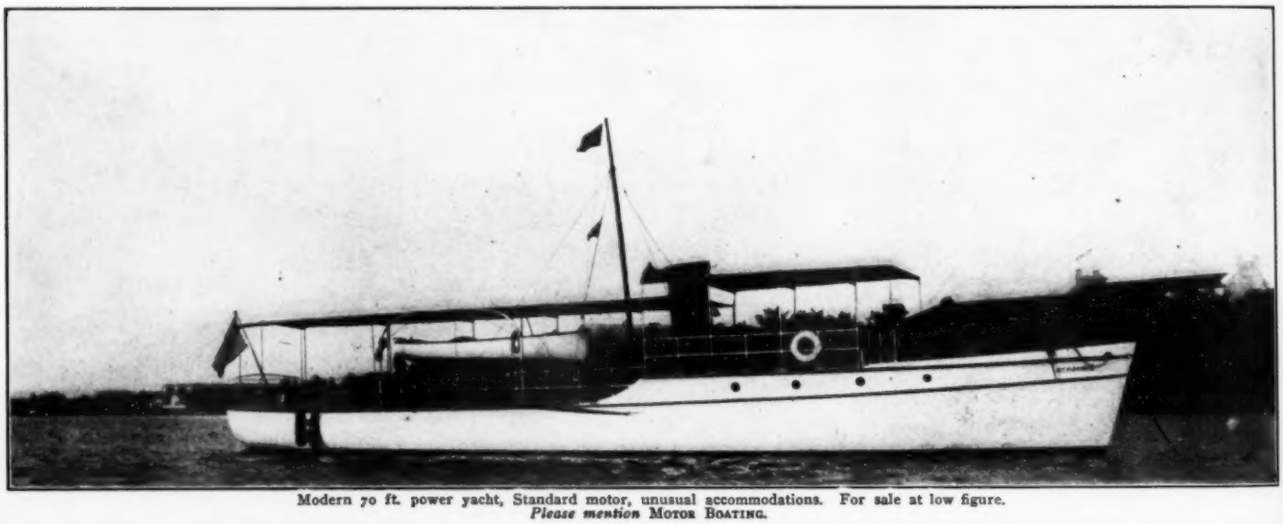
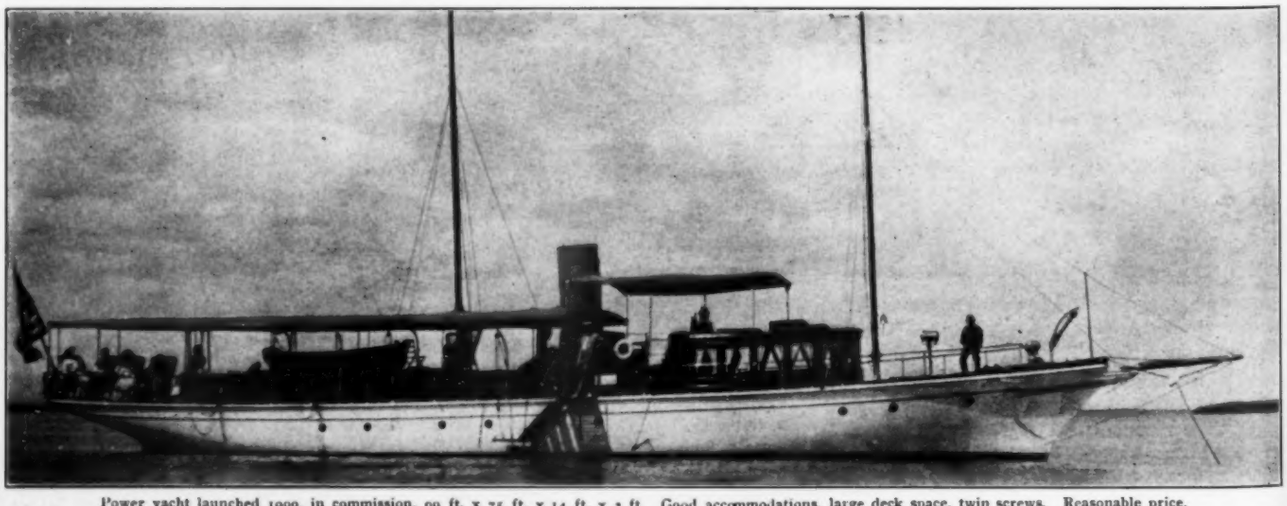
We have a large list of modern power yachts which will be available for charter and for sale this summer and most complete records of other yachts, sail, steam and auxiliary, that are for sale and for charter.



FOR SALE at a sacrifice, owner unable to use. Available for charter, modern cruising motor yacht, 70 ft. x 56 ft. x 12 ft. 9 in. x 4 ft. 6 in.
Please mention MOTOR BOATING.



Modern 70 ft. power yacht, Standard motor, unusual accommodations. For sale at low figure.
Please mention MOTOR BOATING.



Power yacht launched 1909, in commission, 90 ft. x 75 ft. x 14 ft. x 3 ft. Good accommodations, large deck space, twin screws. Reasonable price.
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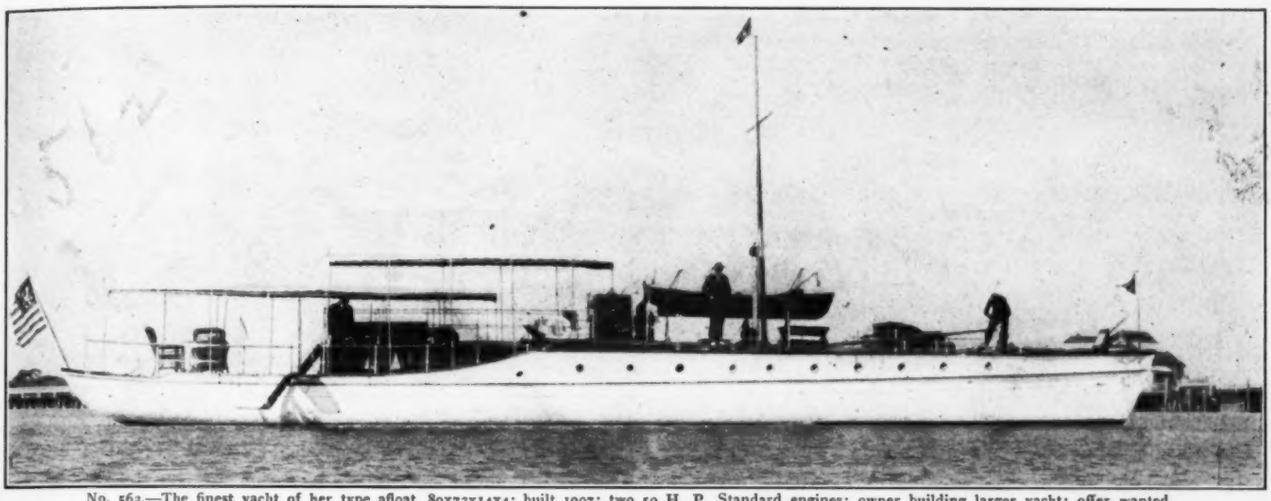
High-Grade Yachts and Launches for Sale or Charter. Over 2,000 Listed



No. 562.—The finest yacht of her type afloat, 80x72x14x4; built 1907; two 50 H. P. Standard engines; owner building larger yacht; offer wanted.
Please mention MOTOR BOATING.

No. 1643.—50x14x3½; built 1902; two 35 H. P. 4-cycle engines; 3 state rooms, social hall, electric light plant, bath, etc. Price $3,500. Act quick.
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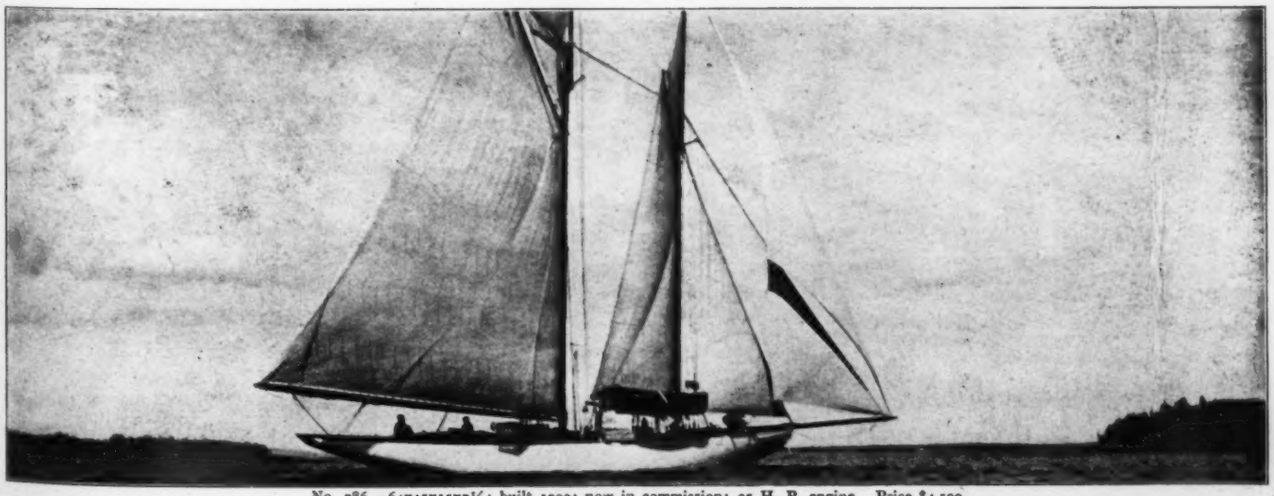
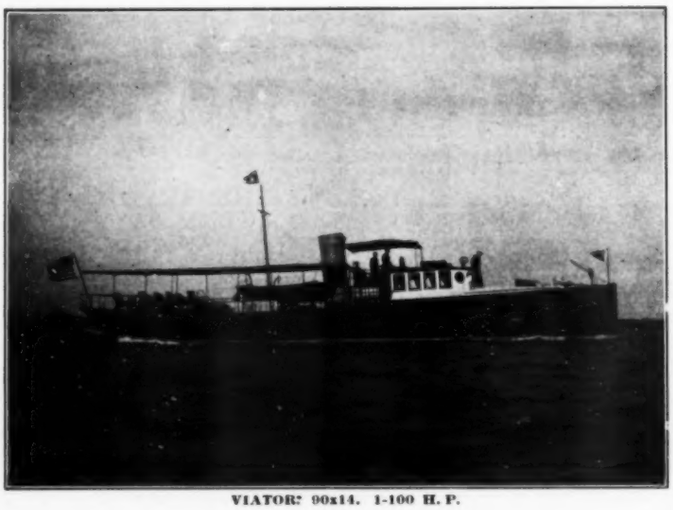
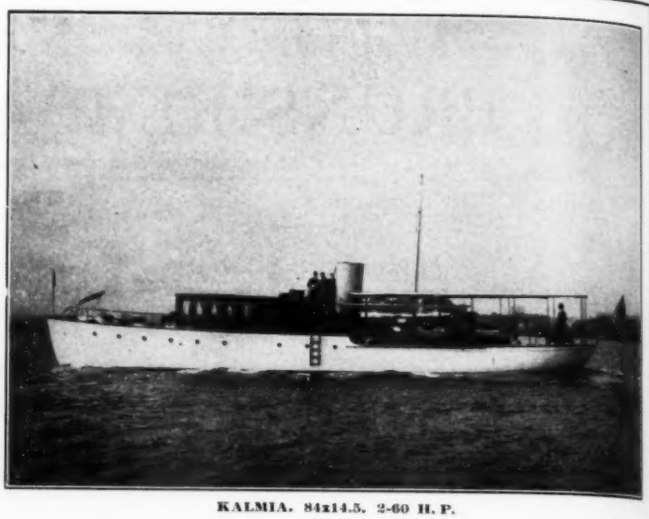


No. 786.—64x45x15x7½; built 1900; now in commission; 25 H. P. engine. Price $4,500.
Please mention MOTOR BOATING.



VIATOR. 90x14. 1-100 H. P.



KALMIA. 84x14.5. 2-60 H. P.

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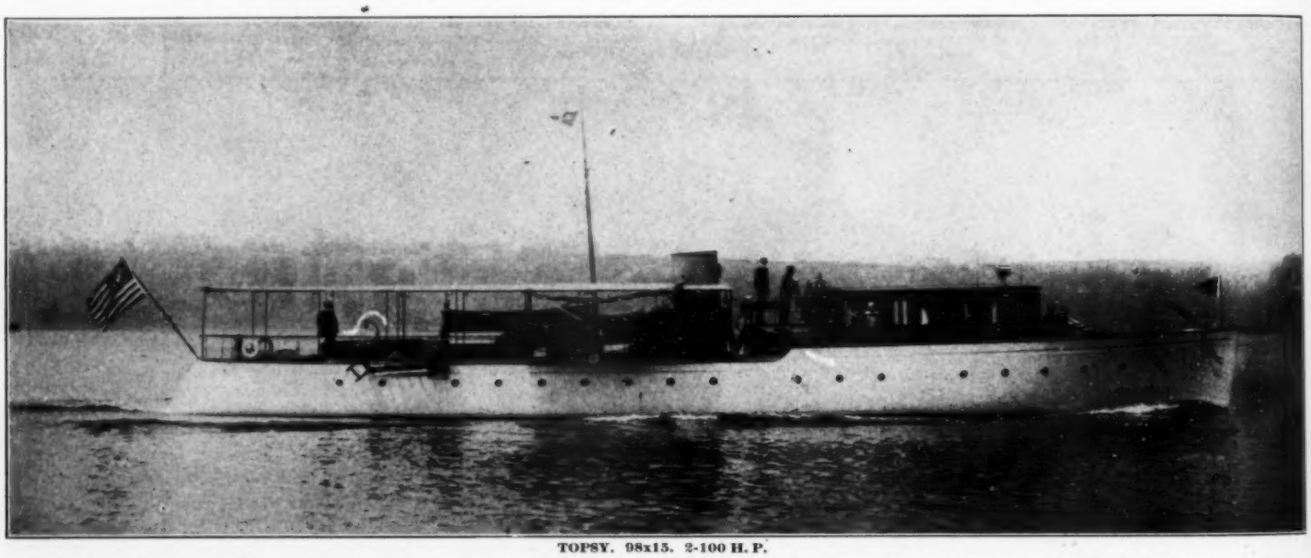
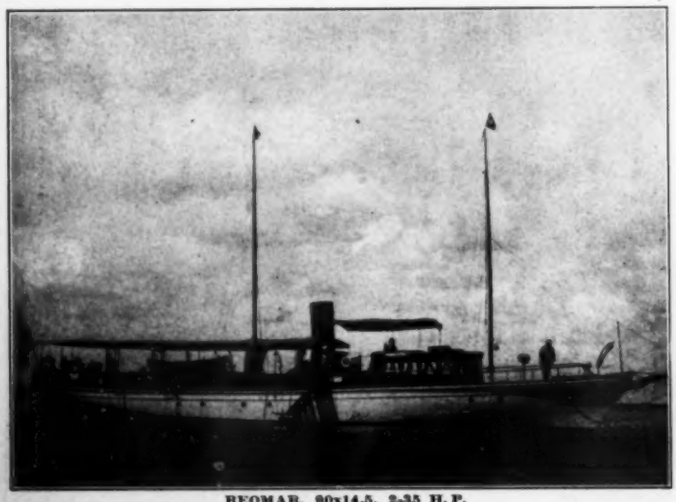
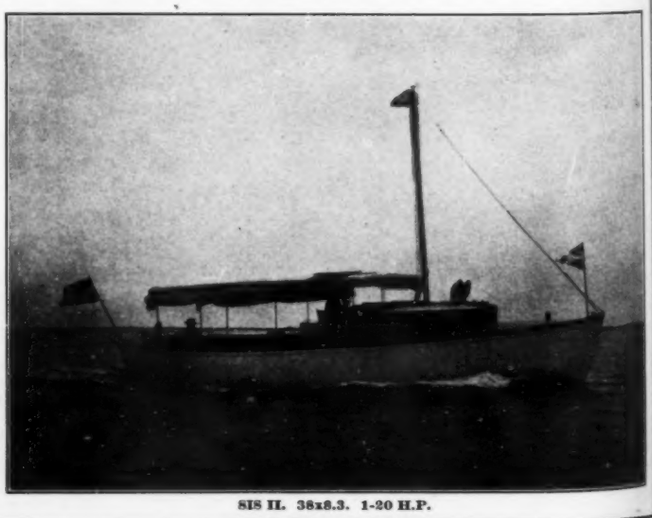


TOPSY. 98x15. 2-100 H. P.

All the illustrations on this page are of recent motor boats from our designs. We have many others under way and will gladly show you plans of any type in which you are interested, and submit estimates of cost of construction.



REOMAR. 90x14.5. 2-35 H. P.



SIS II. 38x8.3. 1-20 H.P.

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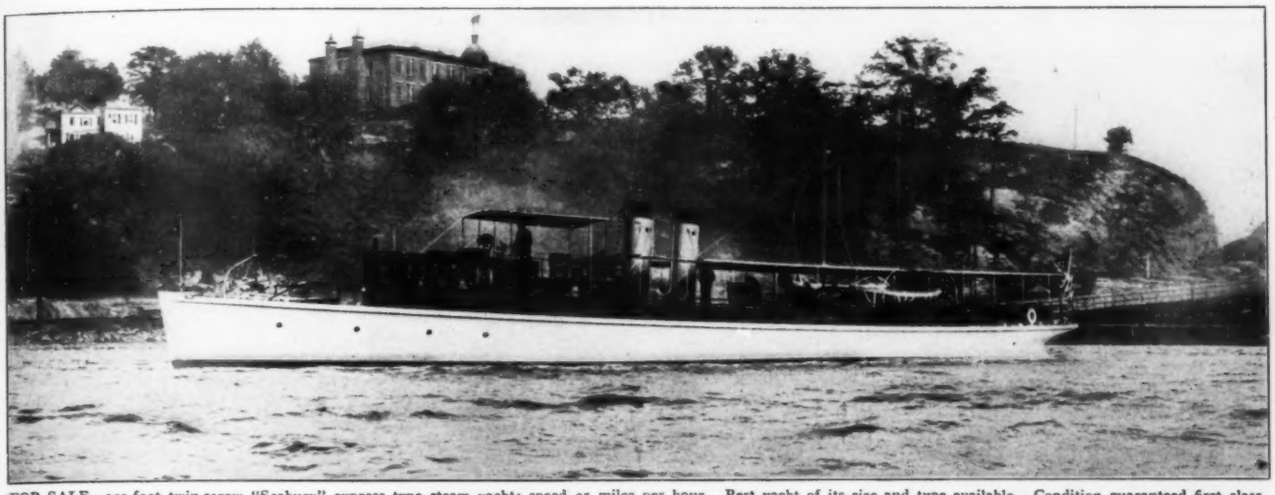

FOR SALE—120-foot twin-screw "Seabury" express type steam yacht; speed 25 miles per hour. Best yacht of its size and type available. Condition guaranteed first class. Must be seen to be appreciated.

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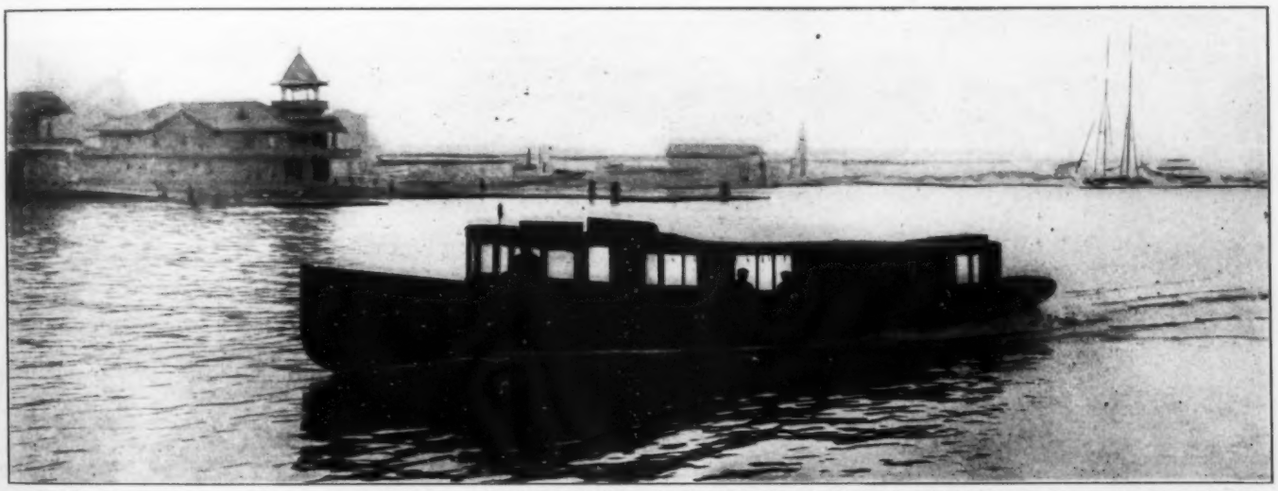

FOR SALE—Gasoline launch, 58 feet over all, 8 feet beam, 3 feet draft; hull designed and built by Herreshoff Mfg. Co., Bristol, R. I.; mahogany planked and finished; cabin forward and aft; toilet room; 4-cylinder, 40 H. P. "Lozier" motor; speed 12 to 13 miles per hour. This will make a fine party boat, having large seating capacity.

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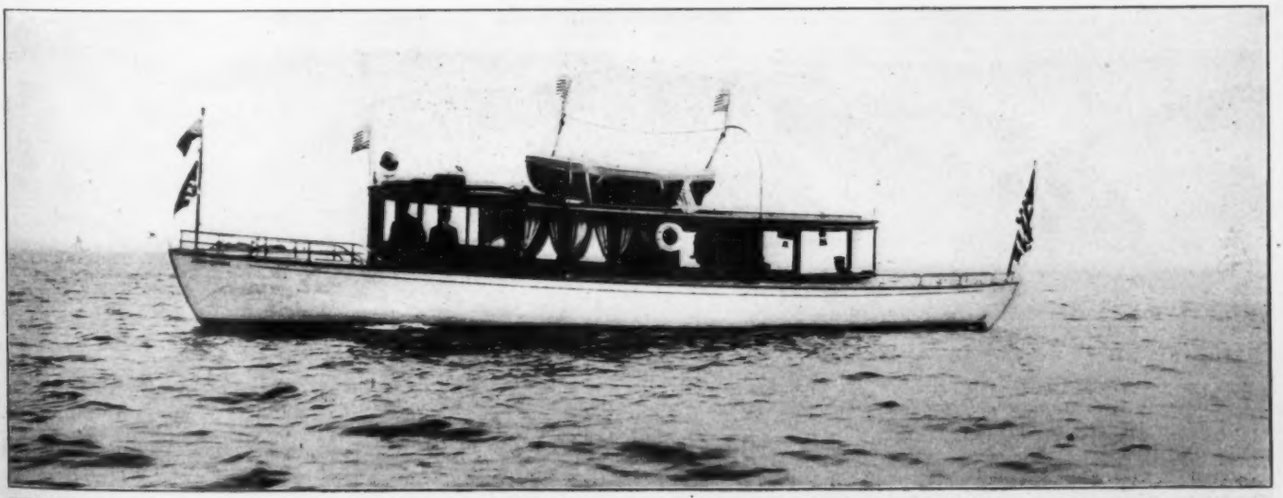

FOR SALE—"Speedway" twin-screw gasoline motor boat, 47 feet long, 9 feet beam, 3 feet draft; first-class construction and finish throughout; sleeps four in owner's party; equipped with two 4-cylinder, 4½x5 Speedway gasoline marine engines, speed 11 to 12 miles per hour; lighted by acetylene gas. Boat and machinery will be delivered in first-class condition throughout. Price reasonable.

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Through our brokerage department we offer a complete list of the best available steam and motor yachts on the market. Complete descriptions, plans and photographs promptly submitted.

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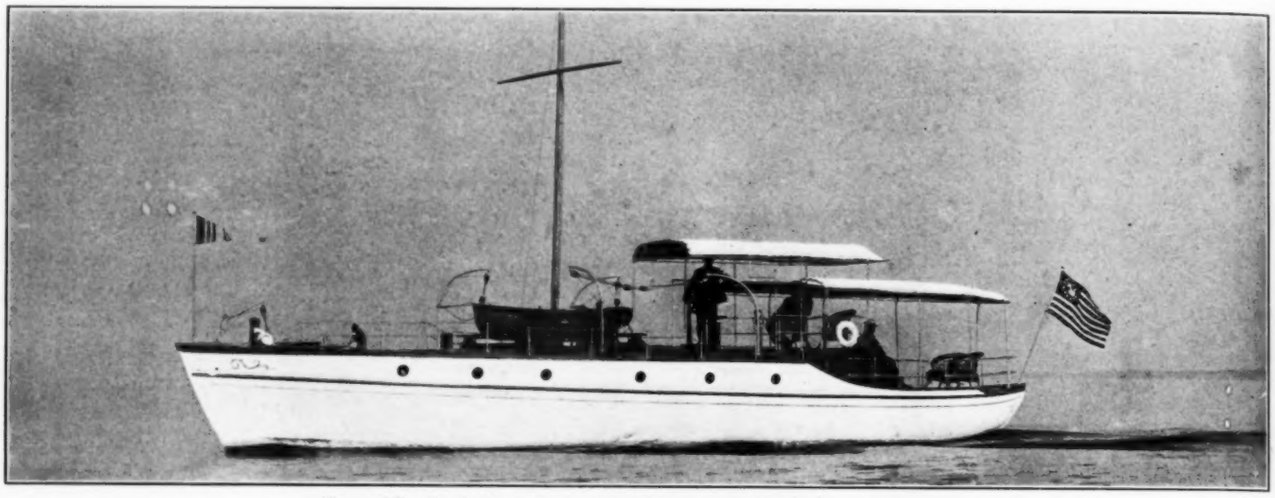
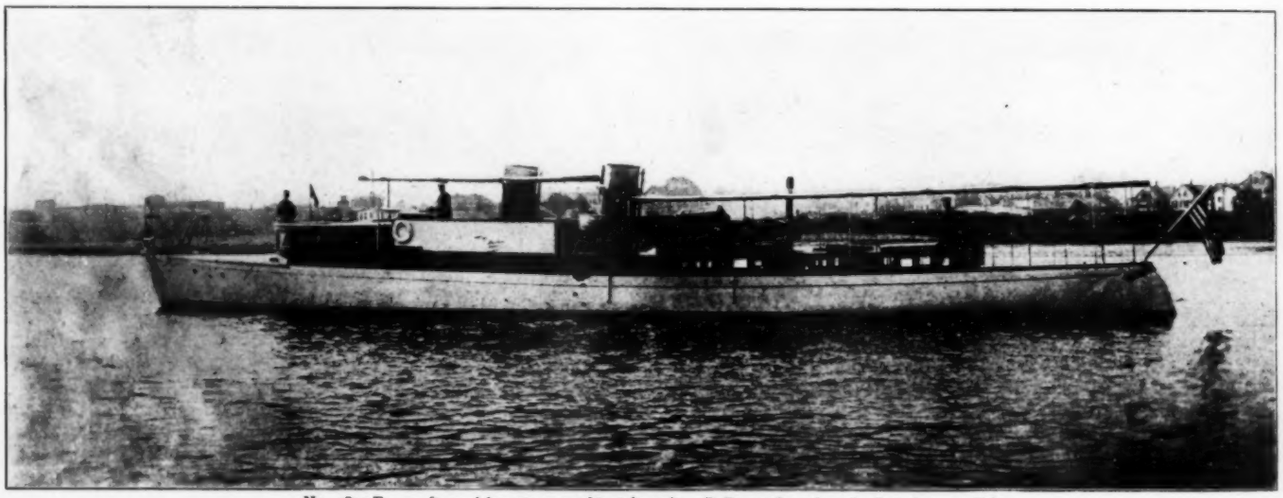


No. 2596-B. To charter; roomy motor cruiser, 55x11.6; Standard motor; sleep six.
Please mention MOTOR BOATING.



No. 2807-B. 94 ft. cruising steam yacht at bargain. Boiler and engines in first-class condition.
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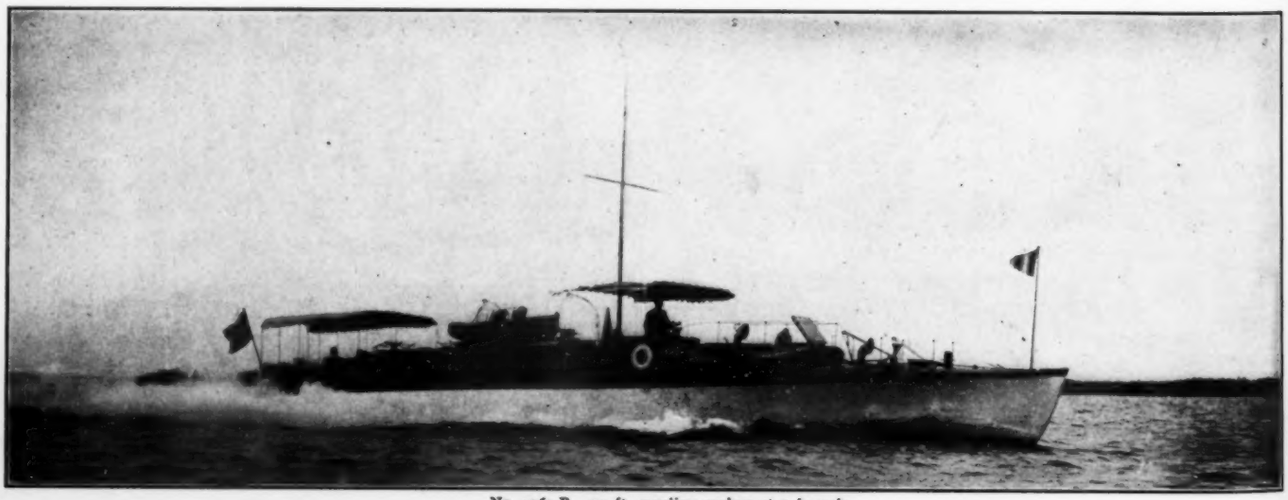

No. 2762-B. 75 ft. gasoline cruiser at a bargain.
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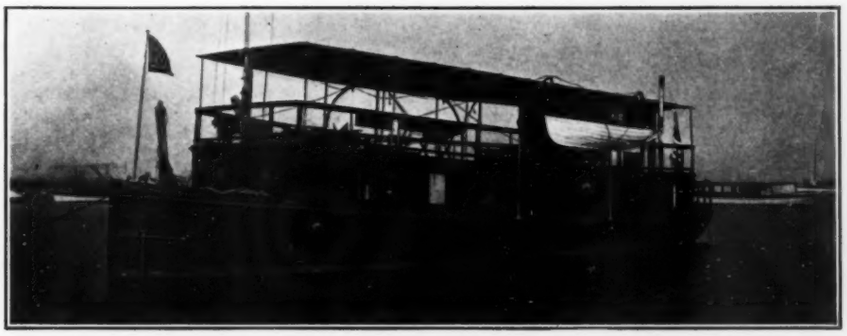
Large List of American and European Yachts of All Types for Sale, Charter or Exchange; Commercial Vessels. Marine Insurance. Descriptions and Photos submitted Upon Receipt of Inquiry.

Correspondence Invited

No. 1377.—Sacrifice—65 ft. cabin launch; Standard engine.

No. 2715.—40 ft. seagoing raised deck cruiser; Standard engine.



No. 498.—Sale or charter—Comfortable power houseboat; three staterooms, bathroom, cabin, etc.
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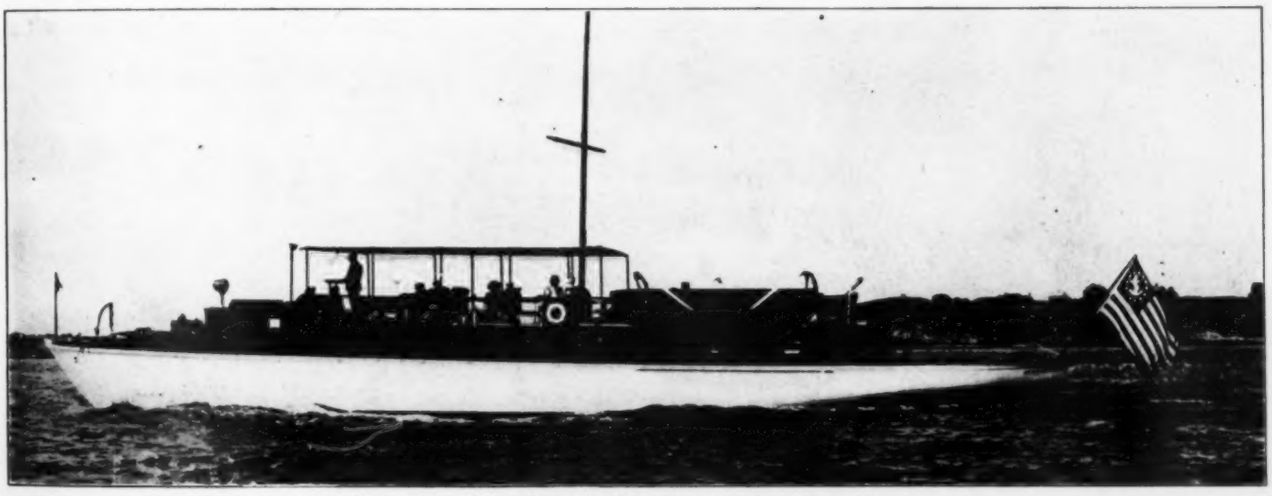

No. 1278.—93 ft., 14 miles, twin screw motor yacht; three staterooms, etc.
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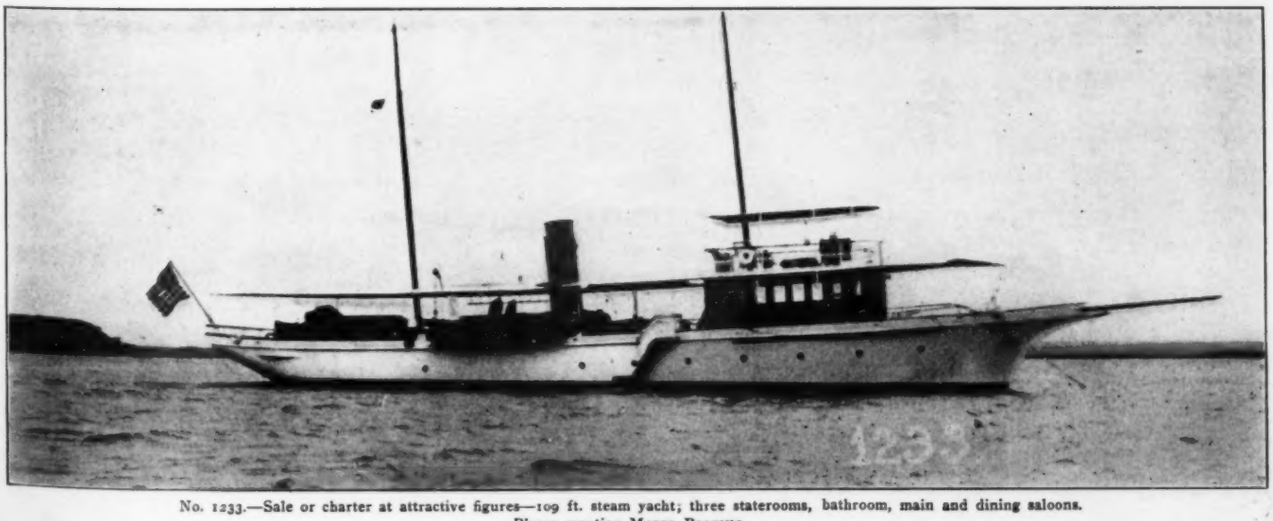

No. 1233.—Sale or charter at attractive figures—109 ft. steam yacht; three staterooms, bathroom, main and dining saloons.
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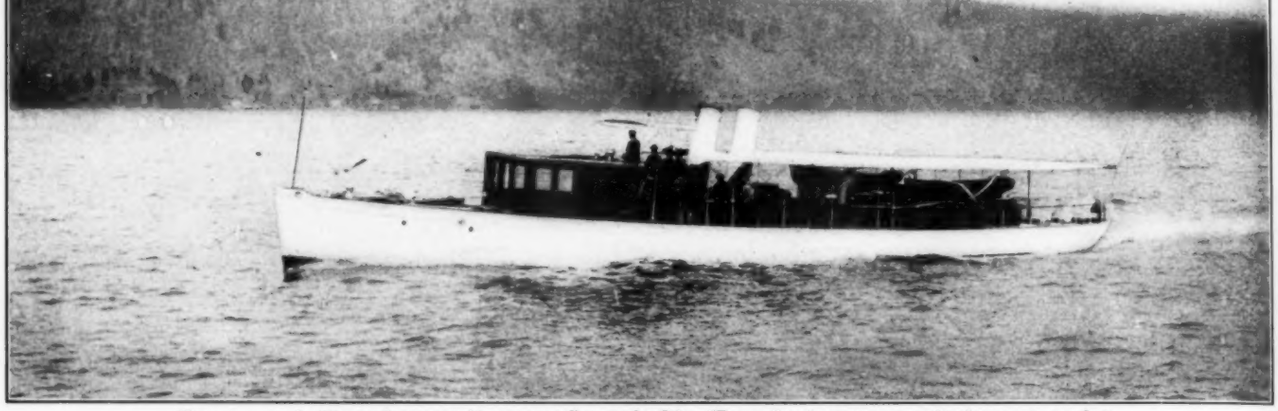

No. 2414. 100 ft. "Express" steam yacht, over 20 miles speed. Other "Express" and coast steam yachts from 75 to 175 feet.
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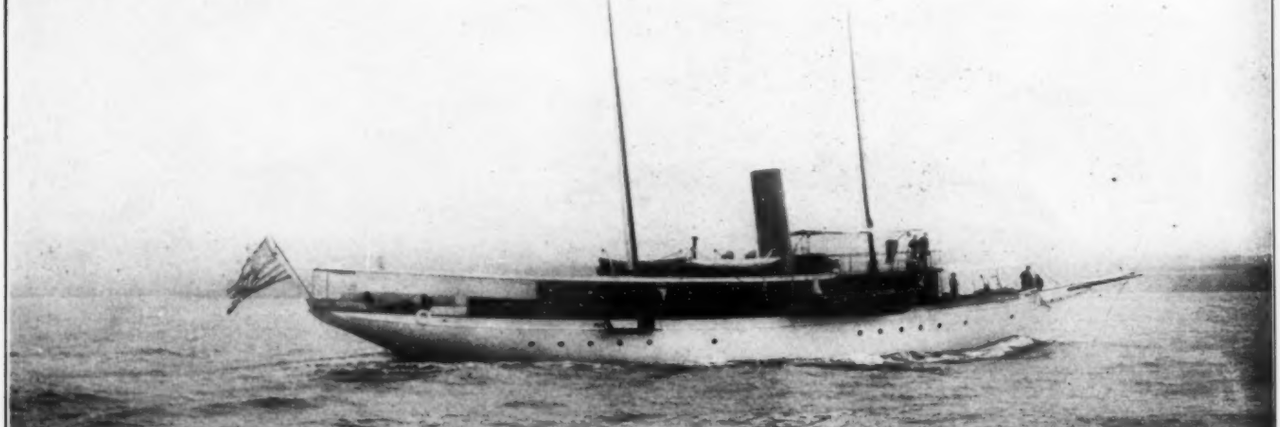

No. 87. 130 ft modern steam yacht; could be chartered. Other sea-going steam yachts ranging from 125 to 300 ft. length.
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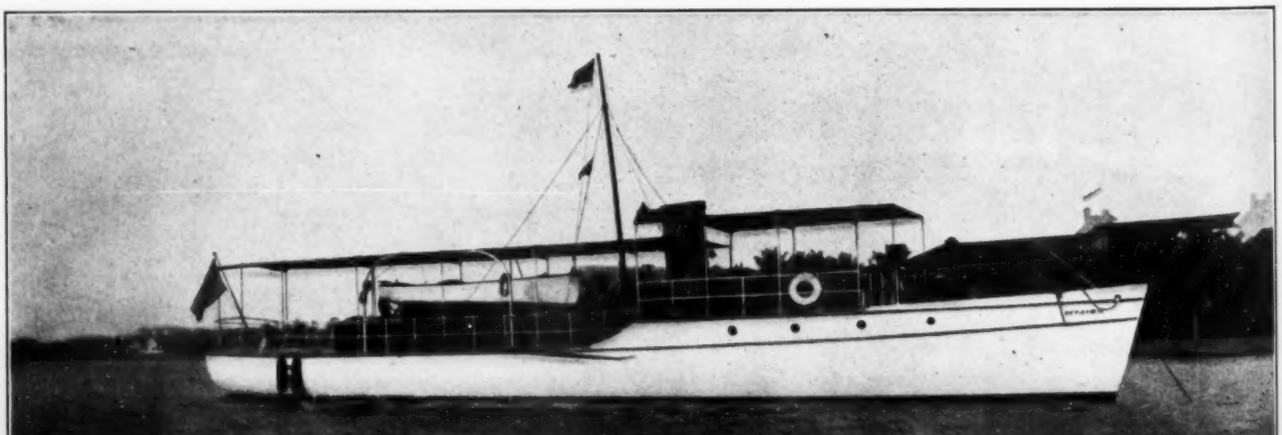

No. 4230. 70 ft. gasoline cruiser; Standard motor. Other gasoline boats ranging from 25 to 125 feet.
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Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention MOTOR BOATING.

FOR SALE cheap, 30-foot launch, 10 H. P. Mianus engine; in good condition; can be seen running. Apply at Columbia Hotel, Castleton Ave. and Columbia Street, West Brighton, S. I.

FOR SALE.—A rare opportunity, auxiliary polemasted sloop; 33 x 26 x 12 x 3, 11 h. p. motor; large cabin and complete equipment, including electric lights; boat is sound and perfect, but must be sold quickly. LESTER J. CARGILL, Norwalk, Conn.

AUXILIARY cruising keel yawl Florence, now at Nock's Yard, East Greenwich; 29 o. a., 19 w. l.; complete inventory; a bargain. H. W. Westcott, Pequabuck, Conn.

WILL EXCHANGE my launch that cost three thousand dollars for a 1909 touring car. John Martin, 43 Dorrance Street, Providence, R. I.

FOR SALE—CABIN LAUNCH, 32.4x9.3x3, self-bailing cockpit; very strongly built; fully equipped, exceedingly able; 15-hp., 4 cycle motor, 425 r.p.m reverse gear attached. Apple dynamo; speed 9½ miles; price very reasonable. H. W. Hathaway, Somerset, Mass.

PROSPECTIVE buyer of a motor boat for "cruising;" from about 10 to 12 H.P. solicits bids. Please send catalogues. Address "E. P. Motor Boating," P. O. Box 448, New York.

LAUNCH (new), 25x7½, standing top, 8-horsepower engine; all complete; price $500.00. A. J. Simpson, 223 Clinton Ave., Newark, N. J.

FOR SALE—New 30-ft. Launch and 38-ft. Auxiliary Yawl. Miller's Ship Yard, Patchogue, New York.

FOR SALE—47x10 oak and cedar glass cabin cruiser, 18 H. P. Standard engine, speed 11 miles; like new. Address 1417 N. 55th St., Philadelphia, Pa.

MOTOR BOAT, 22½ feet long, 6 ft. beam, 5 H. P. Capital engine with reversed gear, copper fastened and brass fittings; all in first-class condition; price right. Inquire of Walter Tibbetts, Gardiner, Me., R. F. D. 15.

FOR SALE, CHEAP—3½ horsepower Holley engine; complete outfit to install in boat. Fred I. Barney, East Providence, R. I.

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GENTLEMAN'S SPEED BOAT, 25 feet long, 5 feet beam, 2 feet draft, with four-cylinder Fox engine and clutch; will sell boat or engine separate. Fred I. Barney, East Providence, R. I.

TO REMIND YOU AGAIN—Place your order now for that launch; none better built. Chas. J. Nelson, Princess Bay, Staten Island, N. Y.

SPEED hull 34x4½ ft. built last season; bargain at $150.00 to quick buyer. Chas. J. Nelson, Princess Bay, Staten Island, N. Y.

AUXILIARY cruising sloop for sale, 25 ft. o. a.; also new six-room bungalow. Address, T. P. Kenny, Bayside, No. Weymouth, Mass.

BARGAIN—21-foot launch "Manon," six horsepower Gray engine; A1 condition. $275 cash to quick buyer. R. L. Conant, 159 Warburton Ave., Yonkers, N. Y.

GLASS CABIN CRUISER, 24 x 8, 6 H. P., Mianus; sleeps four. Inventory; biggest little boat for $350.00. Canfield 95, Wilsey Street, Newark, N. J.

FOR SALE, 29-ft. hunting cabin launch, 3-cylinder engine; full equipment; A1 condition. William P. Fowler, Guilford, Conn.

BARGAIN, 25x6½-beam pleasure launch; very fast; no lemon; 9 H. P. Lathrop engine; seaworthy; no letters; call personally. Strochlein, 791 Park Ave., Brooklyn.

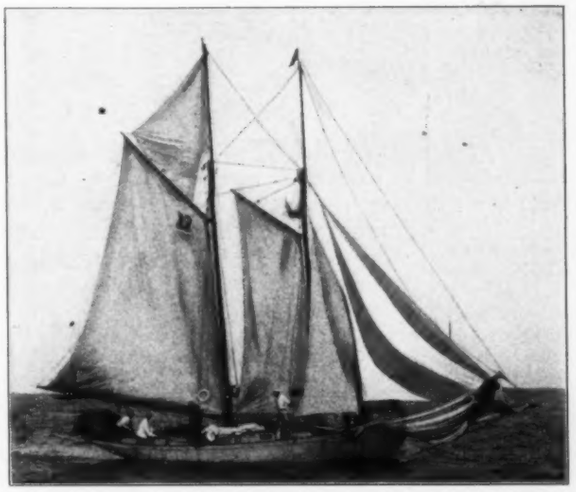
FOR SALE, 33-ft. steel speed hull $150; 19-foot launch 5½ H. P. Ferro engine, reversible propeller and cushions $160. Stevens Duryea 18-H. P. runabout automobile $250; fine condition. Edward Thompson, 844 Rebecca St., Allegheny, Pa.

BEAUTIFUL LAUNCH, full cabin 8 x 36, worth $1,200.00, sell for $300.00. J. A. Worthington, Quarantine, Mo.

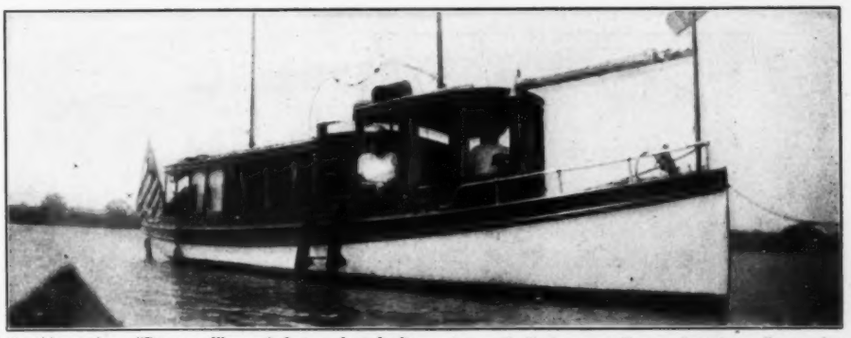
NEW 30 H. P., 4-cylinder, four-cycle Eagle and clutch; full equipment; never uncrated; price $475.00. A. Stainforth, Winthrop, Mass.

GASOLINE CRUISER, fine sea boat; 27 feet o. p., 7 feet beam, 2½ feet draft; 8 foot hunting cabin, 9 foot cockpit; self-bailing; 10 h.p. Jager engine; Apple dynamo, electric fog horn and light, compressed air whistle, side lights and furnishings, complete. Address J. S. Kahler (owner), P. O. Box 165, Newport, R. I.

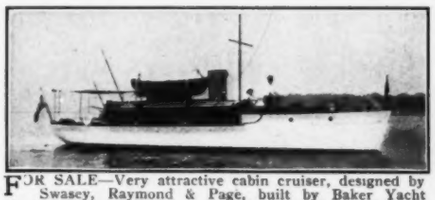
35 H. P., 4-cylinder, 4-cycle TREBERT gas engine, in perfect order, cheap or will trade for smaller engine; 3 H. P. PERFECTION, complete, at bargain, $30; 3½ FERRO, used four months, $55. Louis K. Stam, Chestertown, Md.



FOR SALE—Auxiliary cruising schooner "Restless." An able, seaworthy craft, capable of going anywhere in any weather. Winner in her class of the 1909 Bermuda Race. 40 feet 6 inches over all, 11 feet beam, 6 feet draft. Full headroom in cabin. This boat was built by Lawley, and has mahogany finish throughout, and is in every way a desirable craft. Has 10 H. P. auxiliary engine, giving her speed of 5 miles an hour under power. Sails and outfit of the best. Big bargain if taken at once, and can be purchased for $1,200, owner being desirous of getting another boat. Apply to Hollis Burgess Yacht Agency, 15 Exchange St., Boston, Mass.



Full cabin cruiser, "Rosamond"; 40x8 feet, 3 feet draft; 10 h.p. 20th Century gasoline engine; ten miles an hour; carved mahogany fittings throughout; solid brass trimmings; complete outfit of furniture, lamps, tenders, etc., ready for a cruise; four berths in saloon and pilot house; two berths in engine room; two toilets; complete galley with large ice-box; sixty gallon water tank; 200 gallon gasoline tank; two sails and necessary rigging; cost $5,500; carries $3,500 insurance; will sacrifice for $2,850. Dr. William G. Schaf hirt, 1010 F. Street, N. W., Washington, D. C.



FOR SALE—Very attractive cabin cruiser, designed by Swasey, Raymond & Page, built by Baker Yacht Basin, Quincy, Mass., 1908. 46x40x9' 6"x3. Built in very best manner throughout. Very handsome cabin finished in mahogany and white, 6 ft. 2 in. headroom, 14 ft. long. Sleeps four people comfortably. Toilet and two berths for crew forward. Equipped with 25 H. P. Jaeger motor, speed 11 miles per hour. As will be seen by the picture, this boat steers from the bridge deck and is a very handsome craft. Anyone desiring a modern, up-to-date cruiser should not neglect this opportunity, as she will be sold at a reasonable figure. Laid up at Boston, where she can be easily inspected. Apply to Hollis Burgess Yacht Agency, 15 Exchange St., Boston, Mass.

FOR SALE—34 ft. cabin cruiser, 18 h.p. engine, ice box, electric lights, toilet, complete equipment. Bargain for quick purchaser. Address A. Z. Smith, 121 Nash St., New Haven, Conn.

A HUNTING CABIN LAUNCH FOR SALE—30 feet long, 9 feet beam, equipped with an 18 h. p. make and break Phelps engine, sleeping accommodations for four, cabin furnished in mahogany and white enamel. For further information address Geo. W. Caldbeck, St. Johnsbury, Vt.

20 H. P. BUFFALO engine and clutch, good shape, $275.00. A. Stainforth, Winthrop, Mass.

FOR SALE—A two-cycle 12-H.P. brand new engine, complete with fittings. Will sell cheap if sold at once. Write for particulars. E. H. S., 80 Summer St., Boston, Mass.

STEAM YACHT NOVIA FOR SALE

Length 57 ft.--Beam 8 ft.--Canopy top--Triple Expansion Engine--Cylinders --5--7½--12 with 8 inch stroke. Boiler--Deering Water Tube Pressure--300 lbs. This boat would cost at least $12,000 to duplicate. Will sell for $3,000 or will exchange for one or two automobiles of that value. Address, The Hardy & Dischinger Co., Toledo, Ohio.

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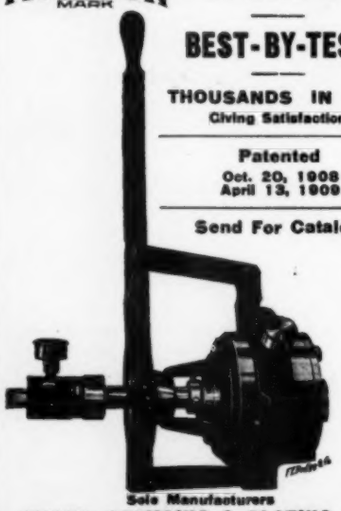

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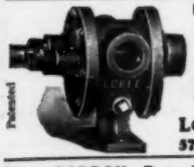

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Will make either fast or slow boats faster and at the same time keep the boat free of bilge water automatically. Write for complete detailed descriptive circular.
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Is superior in efficiency to any other on the market
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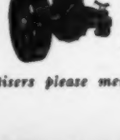

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All working parts submerged in oil at every revolution.
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To the man who is looking for speed, a **Loew-Victor Engine** will prove a revelation.

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Type, 4 cylinder, 4 cycle. Size 4¾ x 5½.
Water Pump, bronze, of plunger type.
Bearings, all crank case, and connecting rod bearings are die cast of white bronze metal.
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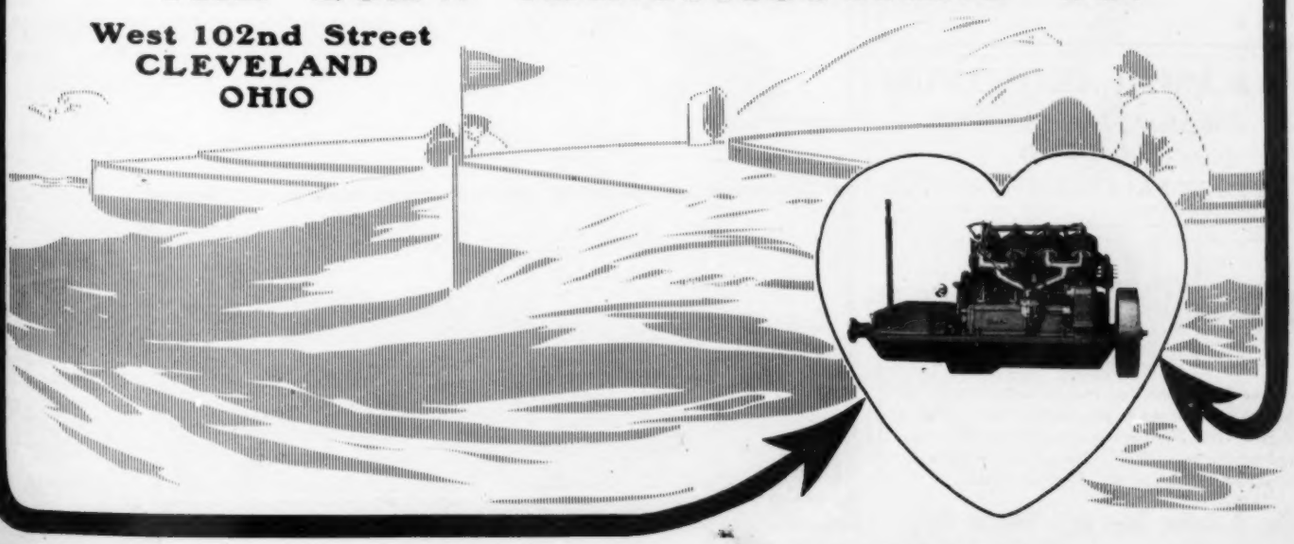

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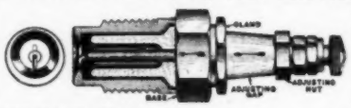

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Our **Wicker Furniture** is the perfection of almost twenty years in the business of manufacturing wicker ware.

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A high speed, perfectly safe boat of a wonderful model. All the luxury of canoeing, all the charm of motoring at high speed, with all the safety of a cruiser—stiff—steady—safe—graceful in design—dry. Comfortable arrangement—and the strongest motor canoe made. Fully guaranteed. Twenty feet long—made of cedar—copper fastened—equipped with the simplest, most reliable, smoothest running, highest grade 3 H. P. engine made. Send today, for Power Canoe Bulletin No. 61, (40)
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Four Cycle Reversible Outfit Complete $42.50
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This 1¾ actual h.p. Four Cycle Motor, with best coil, batteries, shaft, screw and muffler, tested, ready to install in Skiff or Launch. Weight of motor, 80 pounds. Bore, 3¼ in. Stroke, 4 in.

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Our Motor Boat will spend the winter in Southern waters.

WILL GIVE DEMONSTRATIONS. WRITE US.

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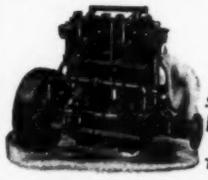

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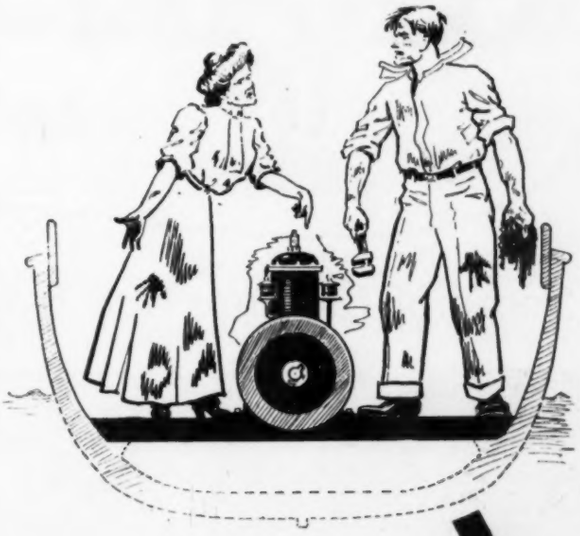
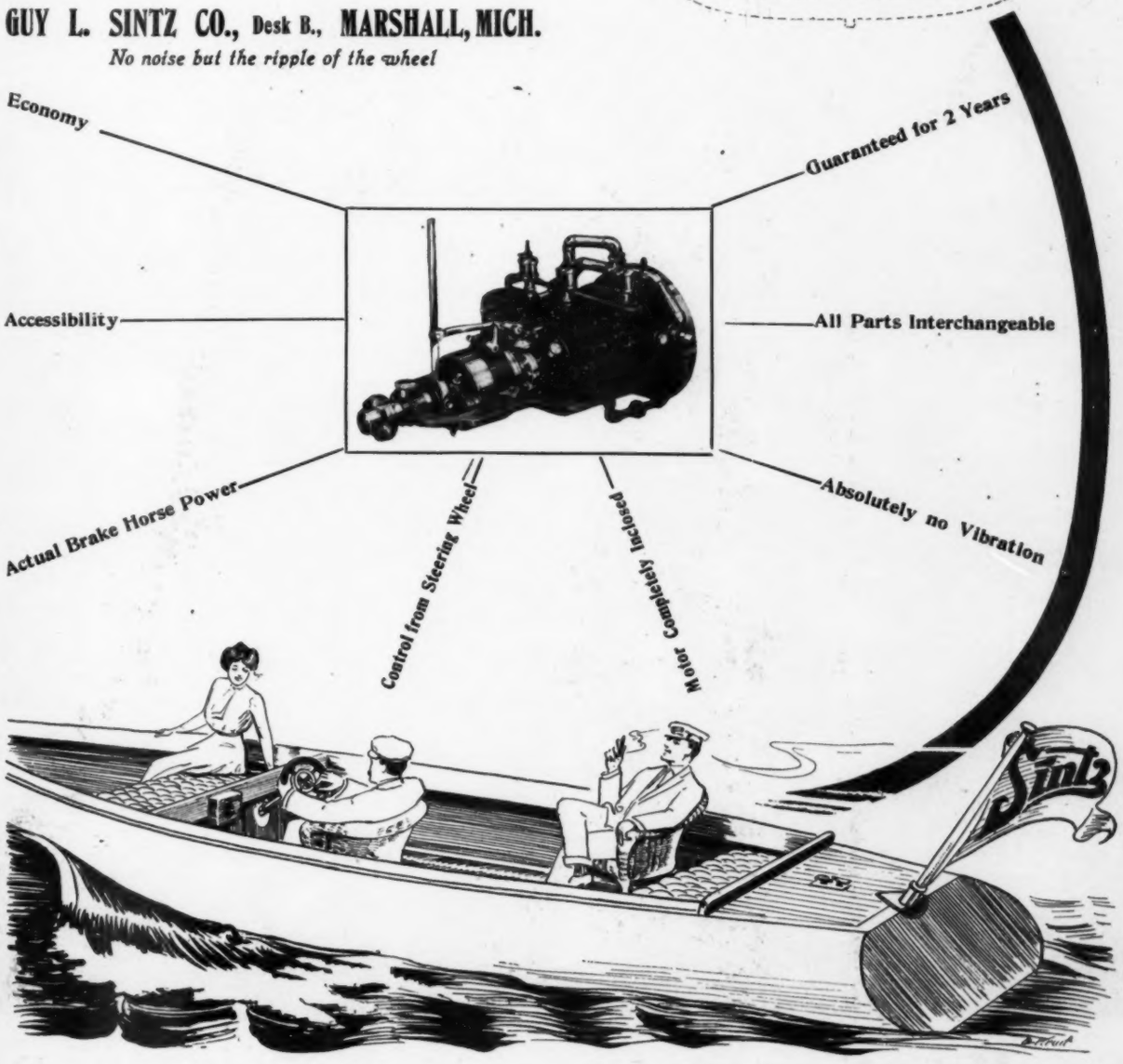
No noise but the ripple of the wheel





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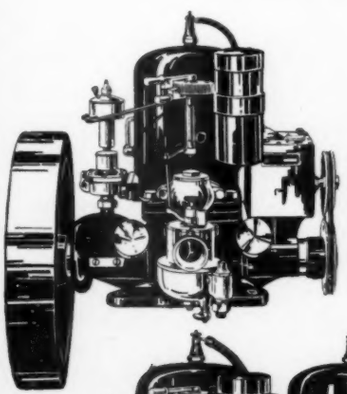

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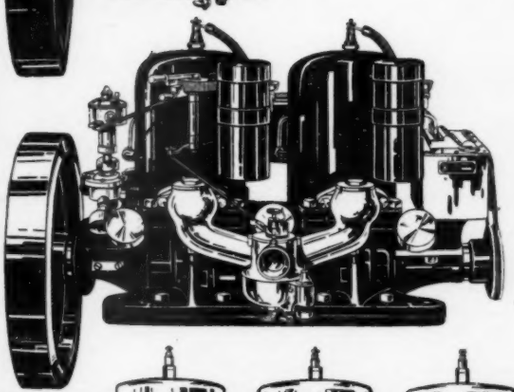
complete outfit



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6-8-12 and 20 H. P.
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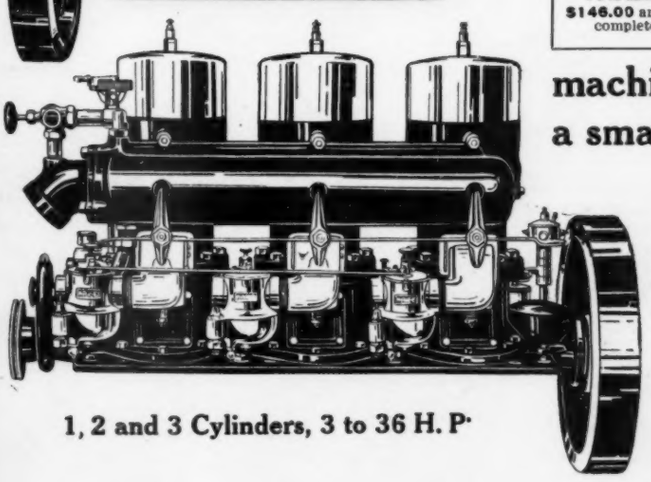

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They win races because they have more power than we guarantee.

They give satisfaction for pleasure and working boats because they are reliable.

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Gray Accessory Catalog.—Low prices on all kinds of high grade boat and engine equipment. Write for it.

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MORE THAN CONVENIENCE IN THIS GEAR

A ***reliable*** reverse gear is a mighty handy thing when making a landing, picking up a mooring or manoeuvering in crowded waters. But it's more than this in an emergency when the ability to reverse may save your boat and the life of every one in it. Every one of the 5,000 users of the

Baldridge
Reverse Gear

knew these facts and they laid particular stress on the word ***reliable*** when they bought the gear. They asked to be shown. They wanted to know why we made such positive claims for "BALDRIDGE" reliability. They didn't buy the gear until they ***were*** convinced.

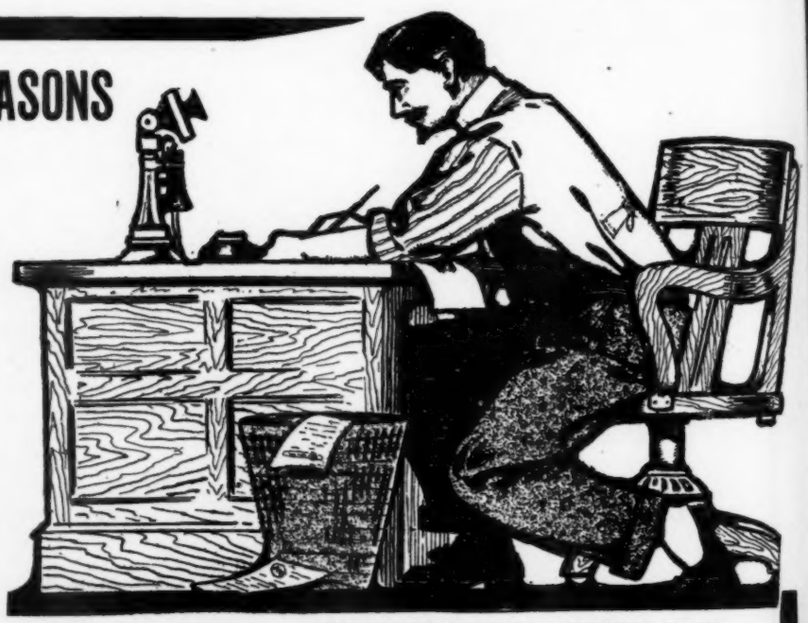
Our free book will go a long ways towards convincing ***you*** that the "BALDRIDGE" is the gear you should have. You can't read it without being impressed with the fairness of our claim that the "BALDRIDGE" certainly is "the gear to bear the wear and tear."

WHERE SHALL WE SEND YOU THE BOOKLET?

SMITH & BALDRIDGE MACHINE CO.
63 Amsterdam Street, Detroit, Mich.

THERE ARE SEVERAL REASONS WHY YOU SHOULD WRITE US

About the famous K-W Magnetos and Ignition Apparatus.



FIRST—Because the K-W Magneto will eliminate ALL Ignition trouble and entirely do away with all necessity of using batteries of any kind.

SECOND—Because you can get more power out of your engine on less gasoline than you can get in any other way.

THIRD—Because every K-W Magneto and Spark Coil carries with it a written binding guarantee, ABSOLUTELY PROTECTING YOU against loss and against trouble.

FOURTH—Because every K-W Magneto and Spark Coil is sold on a 30 DAYS' TRIAL with a MONEY BACK understanding, thus allowing the purchaser to prove what K-W Ignition Apparatus will do in HIS INDIVIDUAL CASE, and he hasn't got to keep it if he is not satisfied in EVERY WAY that it is the best investment he ever made.

FIFTH—Because the purchaser has the added protection that if he finds any defect in workmanship or material on any K-W Magneto within TWO YEARS from the date of purchase, it will be replaced FREE OF CHARGE, and the K-W Spark Coil is **GUARANTEED FOREVER,** and if it EVER breaks down, burns out, or short circuits, we will replace it FREE at any time.

DO YOU want such protection? If you do then use the same good "horse sense" that you do in your business, and

INVESTIGATE TODAY.

THE K-W IGNITION Co.
50 POWER AVE. CLEVELAND, OHIO. U.S.A.

MARGIN of SAFETY

***"Perfex"* Ignitor**
SPARKING IN WATER

Every well designed mechanical device is built with a margin left for SAFETY.

Although the "Perfex" Ignitor (a combined induction coil and spark plug) is merely required to withstand the effects of rain, fog or spray, it will actually spark for weeks when entirely submerged in water.

Also, it is heat and insulation proof. It's built for the HARDEST SERVICE.

50-$10.00 PRIZE CUPS
For Motor Boat Club Races!

Perfex IGNITION
Challenges Any Jump-Spark
IGNITION SYSTEM TO A
WATERPROOF CONTEST

If there is any Ignition System in the World that will spark with its Induction Coil and Spark Plug ***Completely Submerged*** under water ***As Long*** as the ***"Perfex"*** Ignitor will (record to date, 3 weeks, and still sparking), the ELECTRIC GOODS MFG. CO. will distribute to the secretaries of 50 Motor Boat Clubs 50 $10.00 ***"Perfex"*** CHALLENGE CUPS. (These prizes to be competed for at any authorized club races for open motor boats.)

ALL BOAT CLUBS REGISTER WITH US IMMEDIATELY

THIS CONTEST IS TO TAKE PLACE WITHIN 30 DAYS—TESTS AND DECISION TO BE MADE BY THE EDITOR OF ANY LEADING MOTOR BOAT MAGAZINE—SAME TO BE CHOSEN BY OUR COMPETITORS

THIS Contest is OPEN to ALL Jump-Spark Systems

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"Perfex" is the Ignition YOU will Ultimately Use

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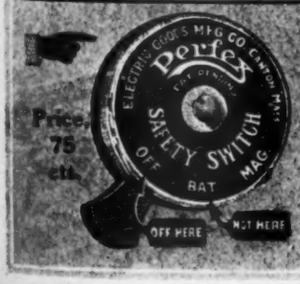
Canton, Mass.

Boston Office: 154 Pearl Street **P. O. Box D**

Send Immediately for Instructive Catalogue. FREE.



Price, 75 cts.

The Perfex Safety Switch Prevents Accidents

BY THE COMMON SENSE ARRANGEMENT OF ITS CONTACT POINTS

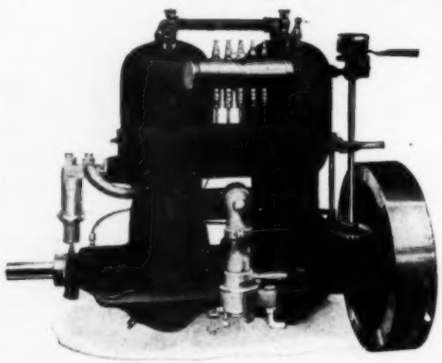
The "OFF" position is placed at the left of the two power positions. This overcomes the danger of throwing the switch-arm past the "OFF" position on the second power contact when trying to stop the engine in case of an impending accident.

Positive Contacts—Switch Arm Removable—Metal Parts Nickel Plated

"Best Switch Made." ***Send TO-DAY for full description.***

Fox Motors Hold the World's Endurance Record!

Cincinnati to New Orleans, 1554 Miles at 29.08 Miles Per Hour



Fox Motors are different from others. They embody the latest and best ideas in marine motor construction. Our Fourth Port Accelerator and our new Fox Carburetor give more power from less gasoline than any other motor on the market.

Fox Motors have proved their efficiency and endurance in hundreds of boats of all sizes and types. Why not in yours?

REMEMBER, ALL FOX MOTORS ARE SOLD UNDER OUR MONEY-BACK GUARANTEE

Our printed matter is interesting. Send for it

FOX

8 H. P., 2 cyl., 3½x3½, Code Able, $150.00
14 H. P., 2 cyl., 4½x4, Code Accept, 220.00
20 H. P., 2 cyl., 5 x 5, Code Acme, - 290.00

The Dean Mfg. Co.
262 Front St.

"South Cincinnati"
Newport, Ky.

HARRIMAN MOTOR WORKS INC.

MANUFACTURERS' ANNOUNCEMENT

We have in stock 100 MEDIUM DUTY MARINE ENGINES, built for the firm of BREED & DE BLOIS (dissolved), formerly of 1876 Broadway, New York. The failure of BREED & DE BLOIS gives the engine buyer the CHANCE OF HIS LIFE, as we will retail these engines at CONTRACT PRICE, direct to the customer. An engine of higher quality cannot be built, and these engines carry our absolute guarantee of quality, workmanship and performance. The Harriman Motor Works will carry a complete line of parts for the engines and will continue the production of this type of engine. Power: 10 H. P. to 30 H. P.

HF High Speed marine engines built by this company will give you more speed for your hydroplane or racing boat, as they are more powerful for their weight than any engine on the market. Power: 10 H. P. to 100 H. P.

Write us for prices and particulars

HARRIMAN MOTOR WORKS INCORPORATED

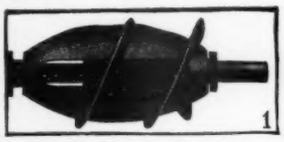
GLASTONBURY CONN.

MOTOR BOATING

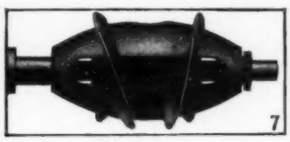
ROPER Safety Propeller

No other propelling device or reverse gear or combination of devices and gears can give in any way the flexibility and ease of control obtained through the use of the Roper Safety Propeller. A reverse gear is in no sense a speed controlling propeller and no other speed controlling propeller dispenses with throttle and spark adjustment during sudden changes in the speed of the boat. The Roper Safety Propeller is a combined speed controlling and reversing propeller and is the Only One Lever Control offered to the Motor Boatman.

Any Speed in Either Direction may be obtained Instantly, Positively and entirely without hitch, jerk or jar, or the boat may be brought to Full Stop absolutely without engine racing or stalling and without touching throttle or spark controls.



Full Speed Ahead.

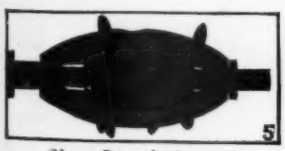


Slowing Down.

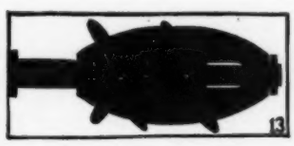
During all changes in speed or direction in which the boat is traveling, the action of the Roper Safety Propeller keeps the load on the engine constant. The motor always turns at the same speed and the propeller shaft revolves in the same direction at the same number of revolutions per minute. Absolutely uniform running of the engine is obtained and there is no waiting to pick up speed or hurried confusion to throttle down.

THE MOTOR BOAT IS RENDERED AS FLEXIBLE AS THE STEAM BOAT

One simple, easy throw of the reverse lever gives any speed in either direction or brings the boat to a dead stop. For use in unknown waters, for trolling, for sailing through uncharted streams or over constantly shifting sand bars the Roper Safety Propeller guarantees Perfect Safety of Control. It obtains a far greater range of speed than any other control, it will send the boat along at a rate much slower than can be obtained by use of throttle and spark and it gives immediate response to the slightest will of the operator.



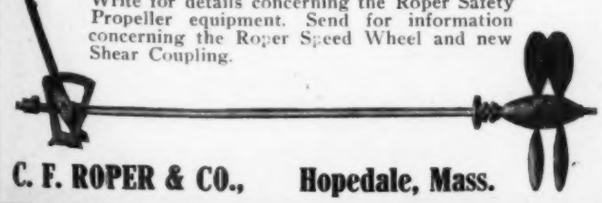
Slow Speed Astern.



Full Speed Astern.

For use on Motor Boats where control is desired from positions alongside, forward or back of the motor the Roper Safety Propeller Bow Control gives all the surety of control of the regular equipment and acts exactly similar to it. The Bow Control is adaptable to all classes of motor boats.

Write for details concerning the Roper Safety Propeller equipment. Send for information concerning the Roper Speed Wheel and new Shear Coupling.



C. F. ROPER & CO., Hopedale, Mass.

Miles away gleam the flashes of motor car brasses polished with

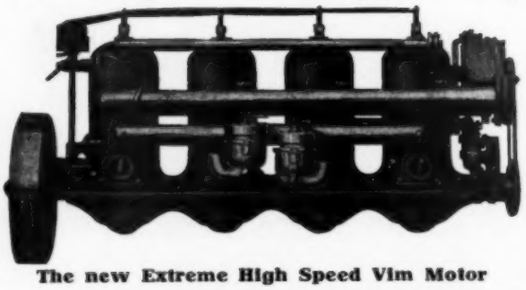
ARCO SPOTZOFF

This is the name of the quickest, cleanest, snappiest metal polish on earth. We like to send samples, especially to motor car owners. Your name on a postcard brings one.

Atlantic Refining Co.
Cleveland Ohio

We are looking for live merchants and garage owners everywhere, and we have a very special proposition to offer the *early* ones. Be early.

At the very top



The new Extreme High Speed Vim Motor

Bore and stroke—4 x 4 inches
2 cylinder—12-15 H. P.
3 cylinder—19-23 H. P.
4 cylinder—26-31 H. P.

Bore and stroke—5 x 5 inches
3 cylinder—35-40 H. P.
4 cylinder—40-55 H. P.

Extreme High Speed

VIM MOTOR

The most perfect two cycle motor made

If you are in possession of all the facts, you will recognize our right to say, without reservation, that the new Vim motor is the most perfect marine motor in the world.

The facts are these:—

The two cycle principle is admitted, even by four cycle advocates, to be the one wholly correct principle of gas engine construction.

Heretofore, however, it has presented seemingly permanent obstacles to further development.

We have swept aside these obstacles and given the world what it never had before — a two cycle engine capable of extreme high speed under load.

That is one result of our work.

The other is greater power — for this new Vim is more powerful by two-thirds than any other engine of like bore and stroke.

We have attained these really wonderful results simply by the addition of a carburetor and a patented system of ports — neither impairing by an iota the beautiful simplicity of the two cycle.

The new Extreme High Speed Vim is the most remarkable marine engine ever produced — it stands at the very pinnacle of perfection.

You can readily satisfy yourself.

The first step is your request for the Vim catalog — which, by the way, describes also the Vim high speed and heavy duty line, motors which stand in the same relation to others of the same type as the Extreme High Speed does to other speed engines.

The Vim Motor Manufacturing Company

440 Market Street, SANDUSKY, OHIO

Representatives:

Southwestern New York, Connecticut and Northwestern New Jersey, OTTO GAS ENGINE WORKS, 136-138 Liberty St., New York.

Portland, Me., G. D. THORNDYKE MACHINE CO.

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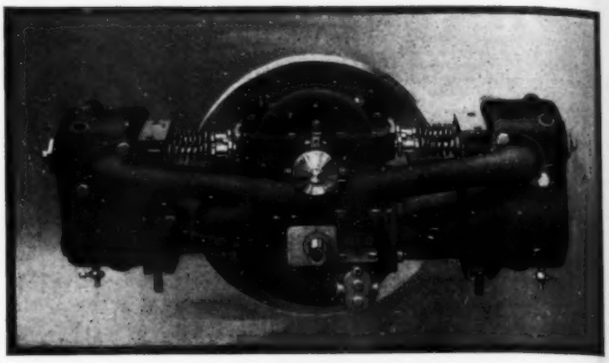
Baltimore, Md., F. B. BURTON.

Northwestern Washington, MARINE SUPPLY CO., Tacoma.

Philadelphia, Pa., W. S. CARMAN, Bourse Bldg.

Montreal, Ont., I. L. LAFLEUR, Ltd.

BEILFUSS MARINE MOTORS.



Of the two cylinder opposed four cycle type.

The Motor which is surprising the boat owners in every locality wherever introduced, on account of their *compactness* (can be placed under seat if so desired), *economy* of fuel consumption, *non-vibrating* qualities, and their perfect *reliability*. When supplied with a good spark and plenty of gasoline they will run until stopped.

The owners of Beilfuss Motors are our best advertising medium. Why? Because they cannot say too much in their praise.

Write for circulars describing our 1910 style motors.

Thousands of unsolicited testimonials on file to prove the above claims.

BEILFUSS MOTOR CO.,

704 Saginaw St., E. Lansing, Mich.

STRELINGER MARINE ENGINES

BUILT EXPRESSLY FOR HARD SERVICE

For more than 12 years "THE STRELINGER," the old reliable 4-Cycle Marine Motor, has stood for the best in Marine Gasoline Engines. A distinct success.

First Quality in material and workmanship from fly-wheel to propeller. The MOST RELIABLE, DURABLE and ECONOMICAL Marine Motor made. The Engine that ALWAYS MAKES GOOD, because it is built right. Famous for *endurance*. Customers who bought the first engines write, "It is as good today as the day it was purchased, always goes, and never gives any trouble, have not spent a dollar for repairs." That is the engine you want.

January, 1910, we purchased the United Manufacturing Company's Plant and will continue the manufacture of the "LITTLE GIANT" 2-Cycle Marine Motors. We can furnish you Engines from 1½ to 60 H. P. Agents wanted. Send for *Free Catalog* today. Send 10c for a nickel-plated pocket marine compass.

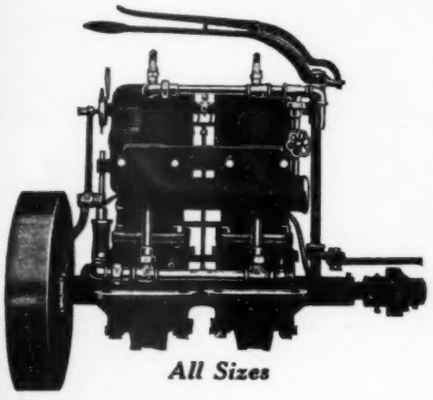
The Strelinger Marine Engine Co.

Nos. 171-175 Woodbridge St. West, Detroit, Mich., U. S. A.

A Concentrated Extract of Power

Assembled in a Neat, Compact and exceedingly Strong Package and Sold under a Positive Guarantee of Efficiency

That's a Tuttle Motor



All Sizes

Tuttle Standard,—unequaled durability, reliability and efficiency combined with ease of operation and permanent excellence of work.

Tuttle Horse Power,—guaranteed to be more than any other engine of the same dimensions and considerably more than rated.

Tuttle Testing,—carried to an unusual degree. Each engine run idle and under load for a sufficient time to develop any defective parts.

Tuttle Guarantee,—for an unlimited time.

You can now purchase a Tuttle for from 20 to 30% less than heretofore. Write for our plan of dealing directly with purchasers. It will pay you. Catalog and full information on request.

D. M. TUTTLE CO., 34 HOLDEN ST., CANASTOTA, N. Y.

Boston Office, 70 Long Wharf. Metropolitan Office, City Island, N. Y.

The Engine for YOUR Boat

is the **Ralaco.** For four years this peerless engine has been the envied of all marine engines. The Ralaco—the masterpiece of 13 years' experience—makes **any** craft an uncommon craft.

You see, the design, construction, workmanship and material that goes into every Ralaco is the very best. If it were possible to get better we would have it. And so our engines "stand up"—they make good. There's not a part in them that's weak, or untrustworthy.

The Ralaco is simple, accurate and sturdy. It has no overhanging valve boxes, which insures more power on the same amount of fuel. Ralaco engines are **guaranteed** to run on one-tenth of a gallon of gasoline per horsepower hour. The carburetor is of the float-feed, self-compensating type, providing uniform quality of mixture. The model governor, the efficient ignition equipment and the system of splash lubrication found in all Ralaco engines means perfect performance always.

Send for the Ralaco Book

It tells all about these famous Ralaco four-cycle engines—10 to 50 h. p.—$400 to $3,000. It's free for the asking. Write today.

THE S. M. JONES COMPANY

112 Segur Ave., TOLEDO, O. Branch, 136 Liberty St., NEW YORK

The First Ralaco

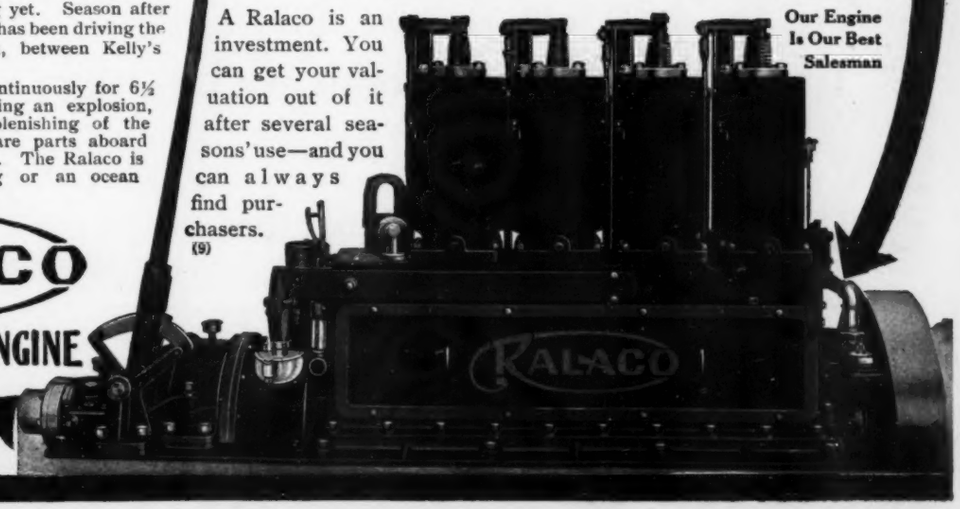
we ever built has run over 10,000 miles without a single mishap. And it's running yet. Season after season this staunch Ralaco No. 1 has been driving the passenger boat D. E. Christian, between Kelly's Island and Sandusky.

In another test a Ralaco ran continuously for 6½ days—24 hours each—never missing an explosion, with no attention except for replenishing of the fuel and oil. There were no spare parts aboard the boat when this test was made. The Ralaco is dependable for a day's outing or an ocean voyage.

A Ralaco is an investment. You can get your valuation out of it after several seasons' use—and you can always find purchasers.

(9)

Our Engine Is Our Best Salesman



RALACO
THE SILENT SIMPLIFIED ENGINE

Osburn Coils

COULD you but visit our factory and see how well Osburn Coils are made, how particular we are with every detail, how every part is inspected and tested, we would have your order without further arguments. Furthermore, we spent thousands of dollars, and over two years, experimenting before we placed a coil on the market. We wanted to be sure that we had something that was **really good.** We have been told that we were too particular. Cannot help it—it's our way. We couldn't put a poor coil on the market. We wanted a coil that we could absolutely guarantee, and still sell at a reasonable price.

But remember—**that this money we have spent perfecting our coils was for your benefit.** However, they cost you no more. To the contrary, we can sell them cheaper, for our design helps cut the cost of manufacture. **Isn't this the coil you want?** If you will order one, you will be a booster for Osburn Ignition. You take no risk for they are sold on **thirty days trial** with money back understanding, and we guarantee our secondary windings **forever** against breakdowns or short circuiting. We couldn't afford to do this unless we knew they were right. The current consumption is low—batteries last again as long. The vibrator cannot get out of adjustment; points are platinum with 15% iridium. The finish cannot be equalled. Write today for catalog and prices of our complete line.

Osburn Electric Co.
70 Fort Street E.,
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Prest-O-Carbon Remover

More Power, More Speed and More Smoothness

AN Engine clogged up with carbon deposits loses compression and power; "pounds," overheats, and gets noisy. Prest-O-Carbon Remover, injected into the cylinders, loosens and removes all carbon from pistons, piston rings, cylinder walls and valves. Clean out your engine with it, and then use it about once a month.

Keeps Your Engine Clean and Healthy

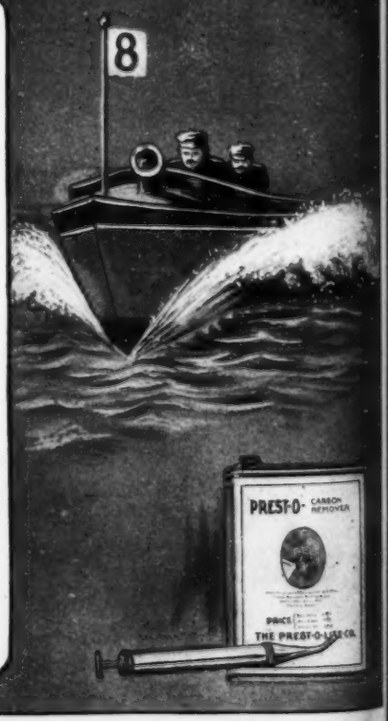
Can also be used effectively in removing lime and other deposits from water jackets and pipes. Makes foul spark plugs good as new. Clean and simple to use. Doesn't affect the metal in any way.

Money Back If Not Satisfied

We will promptly refund the purchase price to any dissatisfied user of genuine Prest-O-Carbon Remover. Beware of imitations containing kerosene or strong acids. Ask your dealer or write us.
Prices: Gal., $3.75; Half Gal., $2; Quart, $1.

The Prest-O-Lite Co., 260 E. South St., Indianapolis Ind.

Branches at New York, Boston, Philadelphia, Cleveland, Chicago, Detroit, Providence, Minneapolis, Omaha, Dallas, Los Angeles and San Francisco.

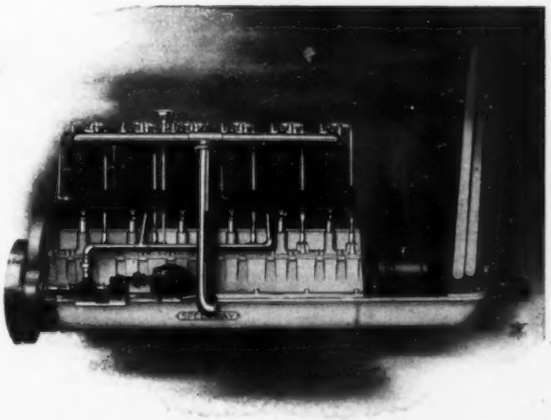


"SPEEDWAY"

means marine gasoline engine efficiency. A strictly high-class up-to-date all around motor for cruising, speed or commercial boats, four cycle type, 8 to 150 H. P. in stock. Hundreds of them in successful operation in all parts of the world.

GAS ENGINE & POWER CO.
AND
CHARLES L. SEABURY & CO.
CONSOLIDATED
Morris Heights, New York City, New York

Designers and Constructors of High Class Craft of All Sizes and Styles for Pleasure or Commercial Service.



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Send 10 Cents for New Catalogue

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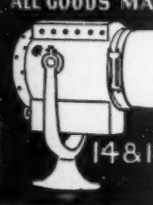
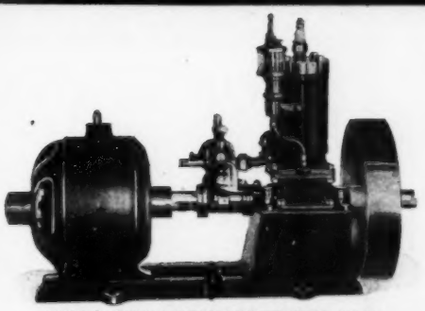
SEARCHLIGHTS ETC.
THE RICHARDSON ENGINEERING CO. HARTFORD, CONN.





NEW 2 CYCLE DIRECT-CONNECTED SETS

These are compact, light-weight and built in small sizes, 1, 2 and 3 H. P., for small cruisers. They are built like a watch; jump spark ignition and are complete in every detail. Ask for Prices.

If you have a Camp you would like to Light, ask for our Booklet on New Low Voltage Residence Outfits

OF INTEREST TO THE OCEAN RACE PEOPLE AND CRUISERS

The Matthews Boat Co.,
Port Clinton, Ohio.
Oct. 31, '07.

Richardson Engineering Co.,
Hartford, Conn.

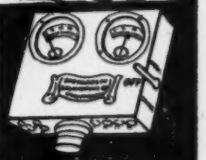
Gentlemen:—Your favor of the 28th inst. has been received making inquiry regarding the service received from the electric installation in my yacht "Onward".

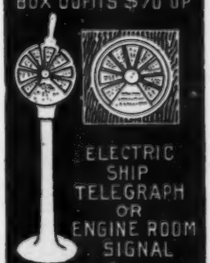
Will state in this regard, that it has given excellent satisfaction in every way. We used the outfit from the time we left Peoria, Ill., until our return the following year to Cleveland, on an extended cruise of over 9,000 miles, and during that period of time, we had the best of light, and no trouble worth speaking of. The only trouble we might mention, was with the belt and pulley on generator. This, however, was repaired, and thereafter no further trouble occurred.

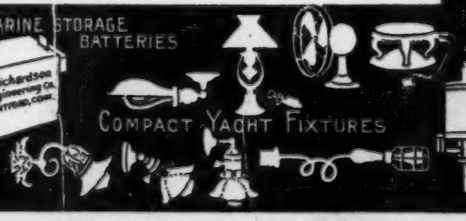
Yours respectfully,
Signed S. J. MATTHEWS.

SJM—ESH

The Richardson Engineering Co., Hartford, Conn.







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The "GURNET" DORY and the TRADE-MARK SEMI-SPEED CLIPPER LAUNCH ARE SEA-GOING MOTOR BOATS

WITH THEIR GOODNESS OF DESIGN AND RELIABLE POWER EQUIPMENT ARE ESPECIALLY ADAPTED FOR USE ON THE WATERS OF THE ATLANTIC COAST AND THE LARGE INLAND LAKES.

THE "GURNET" DORY, 18 TO 30 FEET, IS ABSOLUTELY SEAWORTHY. NON-CAPSIZABLE, SHALLOW DRAUGHT, FAST WITH LIGHT POWER. **"A GREAT LITTLE SHIP"** ONE OWNER CALLS HER.

THE CLIPPER LAUNCH, 25 TO 30 FEET, IS FAST, DRY, SEAWORTHY. DESIGNED FOR THE MAN WHO DESIRES THE BEST; LUXURIOUS MAHOGANY FINISH AND APPOINTMENTS, CORK CUSHIONS, LOCKER SEATS. ICE BOX, ETC.

THE MOTORS—FAMOUS ATLANTIC AND ATLANTIC SPECIAL, ABSOLUTELY NOISELESS, SUBMERGED EXHAUST, WATER-PROOF IGNITION, TROUBLE-PROOF INSTALLATION.

SPRAY HOODS—GENUINE 10 OZ. GOVT. DYE KHAKI DUCK, BRONZE FRAMES.

Catalog D4 on request. To enable satisfactory reply please state requirements.

THE ATLANTIC CO., AMESBURY, MASS.

BOSTON— 93 HAVERHILL ST. NEW YORK, 612-30 CHURCH ST.
PHILADELPHIA, THE BOURSE.

THE NEW BRYANT PROPELLER

"Can beat the best."

EFFICIENCY

DURABILITY

REASONS:

Why our propeller will increase the speed of your launch over any other wheel made.

Our wheel is true pitch ¾ the length of blade, being differential at hub **overcomes all agitation at that point.** This design of wheel gives you a shearing cut from Hub to Periphery, thereby allowing the wheel to work full length of blade, and discharging the water in a tapered volume aft, gives you all the efficiency minus a small per cent. of slip, which can only be procured by a wheel of our design. The peculiar design of a wheel of this kind requires a metal that will hold its shape, and we have a metal as **"strong as steel."**

Money refunded if we do not increase the speed of your launch.

Write for a catalogue.

MANUFACTURED ONLY BY THE

FRONTIER ENGINEERING COMPANY

836 Fort Street, West :: Detroit, Mich.

UPSON-WALTON QUALITY

Everything in the Marine Hardware and Supply Line for Launches, Yachts and Motor Boats.

Catalogue with price list sent on request.

THE UPSON-WALTON CO.
ESTABLISHED 1871
CLEVELAND, OHIO

"PERFECTION" ENGINES *for Perfect Service*

FOR YOUR BOAT

Embody the latest improvements in Marine gasoline engine construction. If you are an expert you will find in the "Perfection" just the features you want; well balanced design—high grade materials—perfect workmanship, finest equipment. Everything that makes for ease of operation, speed, strength and durability—and the finest finish ever put on a Marine engine. "Perfection" engines are painted with three coats of handsome Blue Enamel, striped in Gold and Yellow; the whole finish baked on.

2 H.P. $48
Complete---
ready to install.

All sizes, 2 to 25 H. P.; 1 to 4 cylinders. We replace any Perfection engine that isn't entirely satisfactory. Fine new Catalogue illustrates every part. Tells what you want to know about a gasoline engine. Send for it.

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123 Amsterdam Ave., Detroit, Mich.

Stocks Carried at
New Orleans—Gibbons & Stream, 213 Canal St.
Baltimore—Loane & Hiltz Engine Co.
Boston—G. G. McLaughlin Co.
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MOTOR BOATING

THE WORLD'S STANDARD TWO-CYCLE MOTOR

FERRO

Write Us Today for Ferro Book on Motors and Equipment

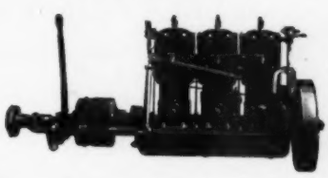
It tells in simple, non-technical language what every buyer should know about their construction and operation. This is sent free to anyone interested in boats or engines. You ought not lose time in securing it.

THE ENGINE IS THE DECIDING FACTOR IN PURCHASING A MOTOR BOAT

The engine should be your first consideration, for on it depends your ultimate satisfaction. We help you to select the best boats, built for all purposes, as well as the best engine.

Therefore, write to us, whether you intend buying complete hull or engine alone. We can send you full information on the best motor boats built.

20,000 Ferros are in use in all parts of the world.



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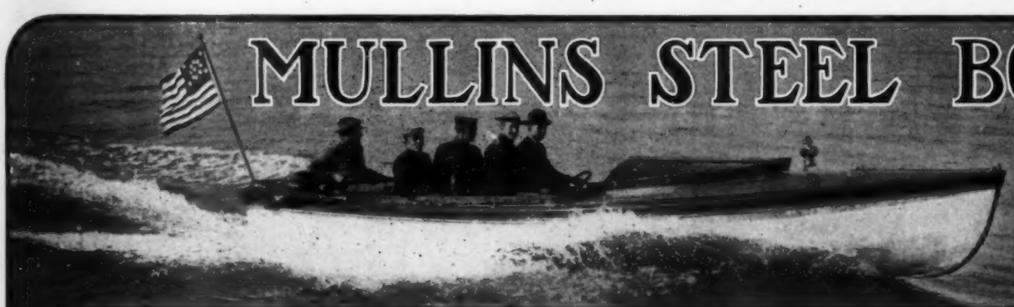
Largest Marine Engine Builders in the World
Main Offices, 790 Superior Avenue, Cleveland, Ohio.
New York Office, 44 Cortland St., 2d floor

Ferro Representatives in All Principal Cities and Ports

MULLINS STEEL BOATS



CAN'T SINK

SAFE, FAST AND DURABLE

Mullins Boats are built of smooth steel, puncture-proof plates, with air chambers like a life boat. They glide through the water easily. Cannot sink, crack, warp, open at the seams, dry out or wear out. Require no calking. Above illustration shows our 26-foot, 40 h. p. launch, with auto seats and control, in Government service. Speed, 17 to 19 miles. Price, with cushions, $1250.

MULLINS $110 LAUNCH

the lowest priced, **good** launch built. Our most famous model. Thousands in use. Engine, hull and fittings same quality as our larger boats. Sold under same guaranty. A staunch, noiseless, speedy, reliable launch at the lowest price ever quoted.

Greatest Values Ever Offered

Six other models, 16 to 24 feet. 3 to 20 h. p. All have 2-cycle engines that **can't backfire,** silent underwater exhaust, one-man control, inside stuffing box, outside gasoline intake, improved carburetor and reversing device, and many other exclusive features.

Complete variety of Row Boats and Duck Boats

$22.00 to $39.00

CATALOG FREE! Big 1910 Catalog describes all launches, also full line of Row Boats, Hunting and Fishing Boats, Marine Engines and Accessories. Write for it.

THE W. H. MULLINS CO., 182 Franklin St., Salem, Ohio

LARGEST BOAT BUILDERS IN THE WORLD

TRY ALL SPARK PLUGS

GIVE THEM A FAIR TRIAL

Seemingly most spark plugs give good service with very little trouble. If once in sixty days you remove your plugs to clean them, you seem satisfied because you believe that all plugs collect a certain amount of carbon and cleaning is a necessity.

Other plugs will give a spark indefinitely without cleaning—yet each explosion of the engine means a greater accumulation of fouling matter that not entirely, but greatly, reduces the sparking strength. To get the most from your engine, the spark must be uniform, and the same always. Give the many other types a trial.

Then Try RELIANCE—"The Spark in Water Plug"

you will appreciate its value. No matter how much soot or fouling matter accumulates, it is impossible to destroy the Reliance spark—its intensity, heat and duration are the same under all and the most adverse conditions. Its construction is along entirely different lines and principles than any other plug. Sold in four types. Regular Type, $1.00; Long Type, $1.25; Mica Back, $1.25; Magneto, $1.25.

JEFFERY-DEWITT COMPANY

SPARK PLUG MANUFACTURERS

DETROIT, MICHIGAN

Old Address--232 HIGH STREET, NEWARK, N. J.

The Speed of Your Boat

and the driving power of the engine depends largely on efficient lubrication. Without a perfect lubrication system—one that will positively operate under all conditions—you will find the power developed in the cylinders reduced to an unsatisfactory minimum at the propeller.

THE "DETROIT"

Valveless, Force Feed

OIL PUMP

is of the sight feed, two piston class. The charge of oil is taken from the oil reservoir, forced through the sight feed nozzle by one piston and then, from the sight feed chamber, is discharged into the bearing by the second piston.

The Detroit Pump, working equally well with the driving shaft turning in either direction, appeals particularly to users or makers of two cycle motors. It insures constant lubrication.

The entire mechanism is readily accessible without disconnecting the tank or draining off the oil. One revolution of the adjusting button regulates the amount of oil to be delivered from zero to full discharge. A dial in the cover, or conventional gauge glass, shows the oil level in the reservoir. Careful attention has been given selection of materials and the workmanship in Detroit Pumps. This Pump is of the same high efficiency as all our products, and is fully guaranteed.

Write for Booklet A64, which illustrates and describes the Detroit Pump.

DETROIT LUBRICATOR COMPANY. **Detroit, Mich.**

GEO·B·CARPENTER & CO.

1840 ***Marine Accessories*** **1910**

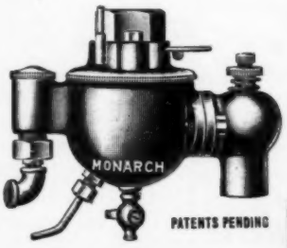
Our new 500 page 1910 Marine Supply Catalogue is now ready—Larger, more complete and more interesting than ever before. It will contain not only the latest ideas in up-to-date Marine Equipment, but also valuable and interesting matter in reference to the care and handling of Marine Engines and of Sailboats, written by men who are recognized authorities. Let us have your application as early as possible with 18 cents in stamps to cover postage, which will be refunded on first order.

GEO·B·CARPENTER & CO.

200-208 South Water Street, Chicago, Illinois

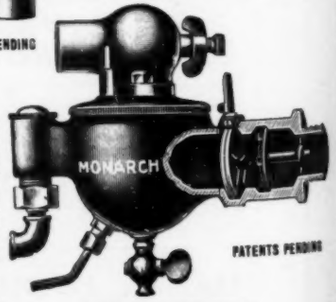
MONARCH CARBURETOR

FOR 1910



MODEL G, VERTICAL
for Three-Port or Four-Cycle

THE 1910 Models of **Monarch Float-Feed Carburetors** show some decided improvements. They are made in two models, G and H. Model G is designed for three-port single and multiple-cylinder engines. Model H is designed for two-port motors. These carburetors are of correct design, and add to the efficiency of motors using them. They are fitted with a very practical and ingenious DISC THROTTLE, interposed between the check and the carburetor.

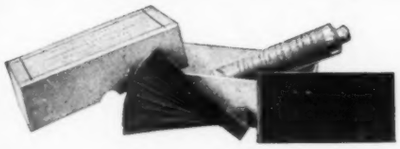


MODEL H, HORIZONTAL
for Two-Port Engines

Write for full particulars, prices, etc.

MONARCH VALVE CO.

116 FRONT STREET **BROOKLYN, NEW YORK**



It is easy to have a perfect valve if you use—

Carborundum
Valve Grinding Compound

This compound is made of Carborundum powders and high grade grease—It is put up in two collapsible tubes—One containing coarse mixture for first rough grinding, the other fine mixture for finishing—
With each outfit is a package of Carborundum cloth strips for cleaning carbonized matter from contact of vibrator points—And a book of Carborundum cloth for general use about the machine—
Carborundum cuts very fast and very clean—
Produces a positively true contact seat—

Outfit complete in neat box 75c

THE CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.

Good Cylinder Oil

More mis-information exists concerning Lubricating Oil than any other one thing connected with the operation of a motor boat.

It is not surprising, therefore, that the man in search of a good oil becomes confused and takes the first thing that comes to hand. Here is the whole thing in a nutshell.

A Cylinder oil is required to do two things—lubricate, and burn up cleanly. All first class oils will lubricate—very few will burn up cleanly—they contain too much carbon. Carbon is removed from oil by filtration. The more completely an oil has been filtered the cleaner it will burn.

Filtered oils can readily be distinguished by their lighter and clearer colors.

HAVOLINE OIL

is the most highly filtered oil made in this country. You can see this for yourself by simply looking at it. It contains less free carbon than any other, and its use will result in cleaner cylinders and spark plugs, and less trouble all round.

Many motor boat manufacturers use and recommend Havoline Oils. Most of the owners of high class boats and successful racers will use nothing else.

Try it on your own boat—it costs no more than any other oils, and gives infinitely better results.

It Makes a Difference.

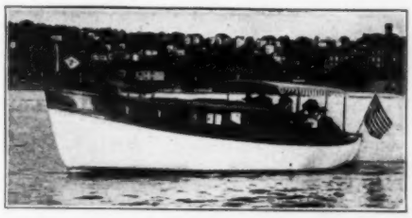
If your dealer does not handle Havoline Oil, write us at any of our branches.

HAVOLINE OIL CO.

96 Broad St. New York — 1906 Broadway New York

Chicago: 1324 Michigan Ave. — St. Louis: 4630 Olive St.
Boston: 224 Milk St. — Philadelphia: 1107 Real Estate Trust Bldg.
W. P. FULLER & CO., Pacific Coast Agents

"Pioneer" In Boat Construction



Stands for Durability, Strength, Seaworthiness, Beauty and Economy

Pioneer Power Boats are in use in every civilized country. We will furnish you the **COMPLETED BOAT** with the engine installed, ready to run, **or you can BUILD IT YOURSELF.**

Pioneer Perfect Frames are the standard of the world. Each rib is bent to **exact shape, fitted and beveled.** Every frame is **set up, trued, tested** and absolutely **finished,** ready for the planking before being taken apart for shipment. We also furnish in addition when desired, everything to complete the boat. With the patterns and detailed illustrated instructions that accompany every frame, you can complete a perfect boat at **an astonishingly small cost.**

You can finish a **cabin cruiser** or a **working boat** as readily from **Pioneer Perfect Frames** as you can a small launch.

Send for our catalog, enclosing 10c. in stamps or silver to cover mailing cost. The most comprehensive book on boats ever issued, fully describing and illustrating 50 different models for both pleasure and commercial use.

PIONEER BOAT & PATTERN CO.
Box 443 BAY CITY, MICHIGAN

ERECTED FRAMES

SAVE TIME—LABOR—MONEY

No. 1284. Length 28 feet. Beam 4 feet.
18 miles per hour guaranteed.

We will build this boat complete

Mahogany Finish, Kenyon Top, Wicker Chairs, Smalley M B B Aluminum Motor

$1000.00

SEND FOR SPECIFICATIONS
Catalog K, Listing 80 other Models FREE

VALLEY BOAT & ENGINE CO.
50 River Street, SAGINAW, MICH.

"THE YANKEE" SILENT MUFFLER AND POWER WHISTLE OUTFITS

THE YANKEE MUFFLER

Constructed of sheet steel, riveted seams, asbestos lined and galvanized. Water cooled for boats. Will operate successfully on 2 or 4-cycle gasoline engine. NO BACK PRESSURE. ABSOLUTELY SILENT. Sizes: ½ to 150 H.P. Satisfaction guaranteed. Over 200,000 in use.

The YANKEE CO., Box "MB," Utica, N.Y.

Both for sale in New York by Durkee & Co., 2 South St.; E. J. Willis Co., 8 Park Place; Chas. E. Miller, 97 Reade St.; P. G. Chapman & Co., 90 West St. Philadelphia: W. P. Carmon, Bourse Bldg. Chicago: Bullock-Waite Co., 66 E. Lake St. San Francisco: California Gas Engine & Supply Co. Canada: Canadian-Fairbanks, Montreal and Toronto.

YANKEE WHISTLE OUTFIT

Complete as shown in cut Nos. 4, 5, 6, 7—$20.00 to $30.00

The Yankee Whistle Outfit may be attached to any gasoline engine of any make or description in a few minutes.

It takes no power from the engine.

It has the only automatic CHECK valve that does not operate on compression. AN EXPLOSION MUST TAKE PLACE IN THE CYLINDER OR VALVE REMAINS CLOSED.

Absolutely safe. No live gases can enter tank.

Easily adjusted and requires no further attention.

Polished four-tone chime whistle, galvanized air tank—equalizes engine pressure—valve closes automatically. Also provided with safety valve.

Fills every requirement of the law. Satisfaction guaranteed.

Mfg. only by The Yankee Co., Box "MB," Utica, N. Y.
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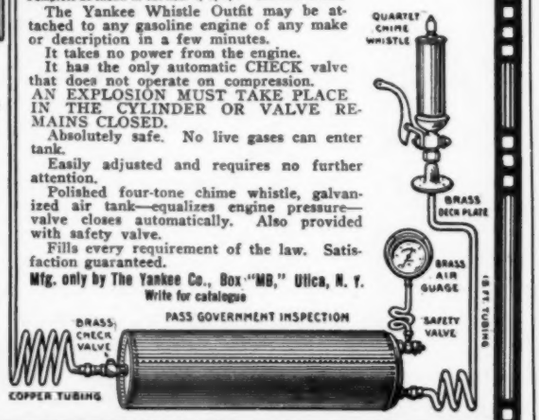


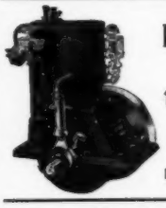
VANGUARD SPARK PLUGS

the better kind. The plugs you are using now may be good but these are better. Get a trial set today and put in your motor. You will see the difference in a minute.

This plug can be removed in a minute and replaced or cleaned. No experience necessary. Sold by leading jobbers and dealers, or sent prepaid for $1.00.

No. American Copper Co., New York, Exclusive Export Agents.
VANGUARD MFG. CO., Dept J, Joliet, Ill.

VANGUARD SPARK PLUGS



LISK MARINE ENGINES

4 cycle type
1 to 6 cylinders 5 to 35 H. P.
Manufactured by
GEO. A. LISK
1190 West Jefferson Ave. Detroit, Mich.

Cape Cod Power Dory Co.

Boat Manufacturers
Write for Catalog
WAREHAM, MASSACHUSETTS

ROBERTS MOTORS ON TOP

W. H. Mullins Co., the largest boat builders in the world recently placed an order for 2,000 **Roberts Motors**, the largest single order for motors ever placed.

That ought to induce you to investigate the **Roberts Motor.**

SEND FOR CATALOG

THE ROBERTS MOTOR COMPANY, 1501 Columbus Ave., Sandusky, Ohio

THE SPRINGFIELD

Single and double cyl. heavy duty motors. Double and four cyl. speed motors. Two cycle, make and break or jump spark ignition.

SPRINGFIELD MOTOR CO.
Springfield, Mass.
Write for Catalogue.

You, Sir!! With a Motor Boat!

Let us send you our 1910

Motor Boat { Guide? Dictionary? Cyclopedia? } Free

We don't know which to call it, for it's the most complete, comprehensive, authoritative Motor Boat Book ever issued by this or any other house.

In it are contained many beautiful color plates and over 1500 illustrations of every—"what-not and what's what"—in Motor Boat necessities and luxuries.

There's economy in every price quoted, and whether your boat is in the Atlantic, the Pacific or the waters 'tween we can serve you promptly and satisfactorily.

A Postal Brings Our Book. It will pay you to get acquainted with the greatest Marine Hardware Concern in the United States.

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DESIGNER AND CONSTRUCTOR OF MARINE GASOLINE ENGINES AND SPECIAL MECHANISMS, SEVEN TO THREE HUNDRED HORSEPOWER

Marine Water Closets
LAVATORIES, TANKS, Etc.
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A jump spark that is absolutely
MOISTURE, HEAT, and WATERPROOF

Plug and Coil combined
New and Improved Patterns for 1909
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Easy to Build
Winter Prices
Knocked-Down Frames or Patterns. Send for circulars.
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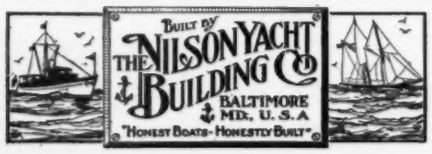

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Brass Frames and Fittings covered with government khaki duck. The best hoods on the market. Send for prices and catalogue
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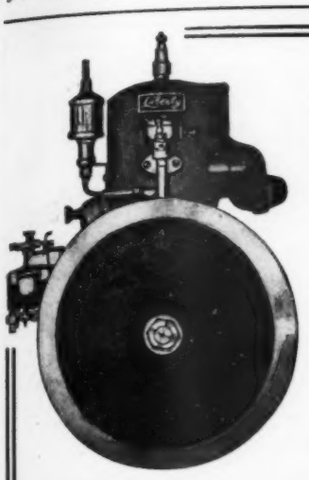
SAMSON TILLER ROPE

Solid braided cotton with center of bronze wire. Strong and durable, and will not stretch nor rust. Send for sample.
SAMSON CORDAGE WORKS, Boston, Mass.

16-ft. Steel Launch $96
Complete with Engine, Ready to Run

18-20-23-27 foot Launches at proportionate prices. All launches tested and fitted with Detroit two cycle reversible engines with speed controlling lever—simplest motor made—starts without cranking—has only 3 moving parts—anyone can run it. Steel Rowboats $20.00. All boats fitted with air tight compartments—cannot sink, leak or rust—need no boathouse. We are the largest manufacturers of pleasure boats in the world and sole owners of the patents for the construction of rolled steel, hull boats, consisting of rolled steel boats, fitted and filled the day they are received. Write for Free Illustrated Catalog and testimonials of 10,000 satisfied users.
Michigan Steel Boat Co., 1226 Jefferson Ave., Detroit, Mich., U. S. A.



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LIBERTY

1½ HP., 2½ HP., 3½ HP., and 6½ HP.
Single Cylinder Motors.

This is the complete Engine outfit for a $100.00 launch which you will find described in full elsewhere in this issue.

We will furnish you a guaranteed 2½ H. P. Motor for $61.50.

This includes Engine, Sight Feed Lubricator, "Schebler" carburetor, Bronze Pump, Grease Cups, Elevated Brass Timer with Reversing Lever, 10-inch Bronze Propeller, Six Feet Steel Shafting, Bronze Stuffing Box, guaranteed Spark Coil, Mica Spark Plug, Jump Spark Wire, Battery Wire, Knife Switch, One Set (6) Drycell Batteries, Battery Connections, Lag Screws, Muffler.

SPECIFICATIONS.—Bore 3¼ in., Stroke 3½ in., Weight Complete 115 lbs., Crank Shaft 1¼ in. Drop Forged Steel, Fly Wheel 12 in. in diameter, Water Jacketed Exhaust with Muffler, Brass Vertical Plunger Pump with both Check Valves enclosed, "Liberty" improved system of oiling, Propeller Shaft ¾ in., Rated 2½ H. P. at 800 revolutions per minute. Our Naval Architect department furnishes you plans for any craft you want to build. These plans and templates are of especial interest to the small boat builder. **Write for Catalog.**

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HERZ WHISTLE OUTFIT

GIVES A STRONG BLAST
SAME AS THE BIGGEST STEAMBOAT.

CONSISTS OF:

1. UNIVERSAL PUMP (Driven by friction from Fly-wheel).
2. STEEL TANK (9 x 20), with all connections, including check valve.
3. BRONZE CHIME WHISTLE.
4. TEN FEET OF HOSE.

COMPLETE OUTFIT
$36.50

Biggest value on the market

It's an Aristocratic Signal for Your Boat

GET POSTED NOW
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Installed in a few minutes
Will last a lifetime
GUARANTEED A YEAR

HERZ & CO.
295 LAFAYETTE ST. NEW YORK, N.Y.

The Most Boat For Your Money

No matter what Racine Boat you buy; whether it's the staunch little Power Dory at $150, the Racine Speed-about shown below, which sells at $300, or the sensation of the boating year, the big 36-foot raised deck, sea-going power cruiser which sells, completely fitted out, at $2200 and is worth $5,000; **you save just about one-half.**

RACINE MUSKEGON

We have reduced the building of boats to a commercial merchandising basis, without sacrificing or slighting material or workmanship, or loss of individuality.

The secret is perfect organization and the biggest boat works on earth. Many boats mean low prices—we build many boats. Our boats are built to stand inspection and criticism by the "boat wise" purchaser.

We will gladly tell you about the boats we make—everything that goes on water from the largest to the smallest. Send today for the story of "Trips to Green Bay" which will help you select the boat you need.

RACINE BOAT MFG. CO.
532 Western Ave.
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This Exhaust Guarantees More Power

When you buy a marine engine, whether for pleasure, speed or heavy duty, you want the engine of greatest reliability. Not one which manufacturers say is the best, but a motor having exclusive features that prove it really has more power and reliability to make it the best possible buy.

Exclusive Syracuse Patent

Our exclusive feature—the Patented, Water-jacketed Condensing Exhaust—gives the carburetor hot dry air to produce a better mixture; cools the firing chamber to prevent pockets of steam; causes quicker condensation of gases and thereby prevents backfire; insures complete and positive scavenging of the firing chamber before the in-rush of new gas; warms the water to cool the cylinders, thereby preventing distortion and eliminating cracking.

Write today for free descriptive catalog telling all about the Syracuse. You will not wonder why this remarkable motor leads in power, speed and dependability.

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Name of agent in your locality on request.

The Engine that called the Sm———bluff.

Ask The Man Who Runs One

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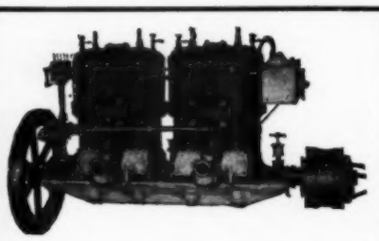
Live Agents Wanted

Great Middle Price—High Grade Motors.

Syracuse Gas Engine Co., 1803 Park St., Syracuse, N. Y.

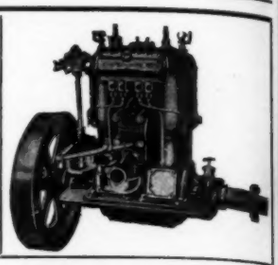


32-40 H. P. FOUR CYLINDER TWO CYCLE, 456 LBS. $500

Atwater-Kent Ignition, Mechanical Force-Feed Oiler, Aluminum Composition Bed and Hand-hole Plates,
Water-Cooled Exhaust and Salt Water Fittings

16-20 H. P. TWO CYLINDER TWO CYCLE, 337 LBS. $250

Salt Water Fittings Throughout



60 H. P. 6 CYLINDER TWO CYCLE 300lb RACER, $2000

Vanadium and Krupp Steel Working Parts. Copper Water Jacket

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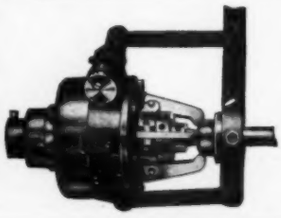
JEFFERY'S PATENT MARINE GLUE

Use No. 1 Extra Quality for deck seams of Yachts and Motor Boats.
Use No. 7 Soft Quality or Waterproof Liquid Glue for filling and waterproofing canvas for covering Boats and Canoes, Cabin Tops and Decks.
For sale by all Yacht, Boat and Canoe Supply Houses and Sporting Goods Dealers. Send for samples, specimens, circulars, directions for use, etc.

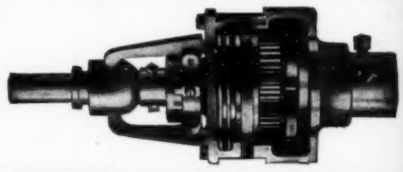
L. W. FERDINAND & CO., 201 South Street, BOSTON, MASS., U. S. A.



SUDDEN REVERSES

Can be safely made with JOES' GEAR
1910 Models now ready

INSIDE FACTS: Multiple disc friction that won't slip. Three slow running steel spur gears that will neither grumble nor break.
Send for 1910 Catalogue **Joes' Improved Reversing Gears and One Way Clutches.**



THE SNOW & PETRELLI MFG. CO.
445 Chapel Street - - New Haven, Conn.

BUILD YOUR OWN BOAT

We build boats, both knock-down and complete—everything from the canoe to the 70 ft. cabin cruiser.

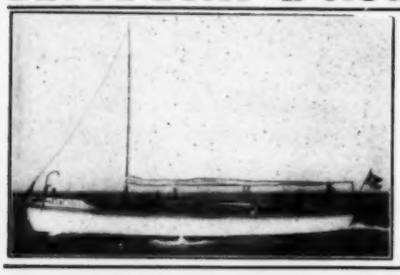
We will furnish you the boat complete with power, or you can build it yourself from our knock-down frames. If you want a boat, we offer a proposition of decided interest to you.

GET OUR FREE CATALOG

This shows one of our cruiser frames ready to be knocked down and crated for shipment.

It is about three hours work for two men to uncrate and re-erect it, and it is then ready to plank. We furnish full size patterns for every piece of plank. Anyone, experience unnecessary, can finish this boat. It of course requires more time, but is really a simpler task than building a row boat. You can build a 35 ft. or 40 ft. cruiser for less money than you would ordinarily pay for a 20 ft. open launch, if bought at any factory in the land.

DEFOE BOAT & MOTOR WORKS, 2322 State Street, BAY CITY, MICH.



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4 Cycle, 5 to 100 H.P.
FOR PLEASURE AND COMMERCIAL SERVICE

High Grade Machinery for Discriminating Buyers
"THE MOTOR WITH THE BORE AND STROKE"
Fuels—Kerosene, Gasolene, Alcohol, Distillate.

WOLVERINE MOTOR WORKS
BRIDGEPORT, CONN., U. S. A.
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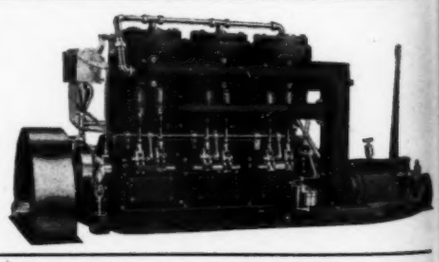


THE HYDE "TURBINE TYPE" PROPELLERS

will add more speed to your motor boat, no matter how fast it is now.

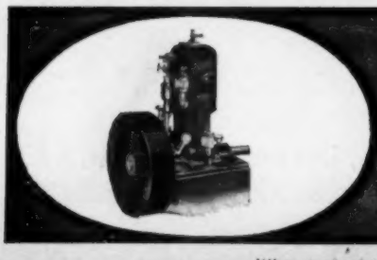
It is designed and built to do just that thing---to give the motor the best "grip" on the water.

It is made of Manganese Bronze of the highest tensile strength.

Let us tell you about the Hyde Propellers and describe the special advantages of their design.

Write for catalog and price list

HYDE WINDLASS CO.
BATH, MAINE



HARTFORD 2-Cycle Marine Engines

The Hartford two-cycle marine engines are made in five sizes, ranging from three to ten horsepower, in one and two-cylinder models.
They are thoroughly guaranteed in every way.
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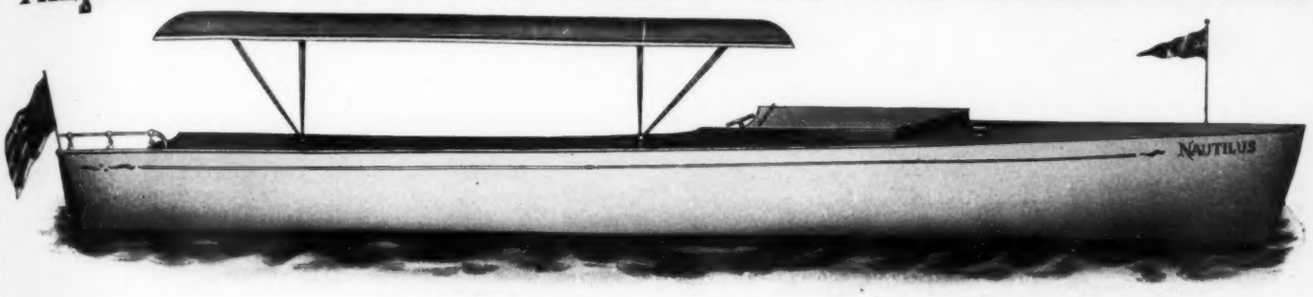
93 Suffield Street, Hartford, Conn., and 117 Commercial St., Portland, Me.

THE BEST MOTOR BOAT OBTAINABLE FOR YOUR SUMMER OUTINGS



We have prepared to manufacture during 1910 over 500 of our *"FIREFLY"* and *"NAUTILUS"* model motor boats. (See illustration above.) These models are light, strong, speedy and extremely safe. Their design is pretty, their construction is scientific and high class, and their material the best. The engines are high grade and absolutely reliable.

Purchasing material and manufacturing in large quantities enables us to put these desirable craft on the market at the following very attractive quotations:

"FIREFLY" model, 18 FEET IN LENGTH, EQUIPPED WITH A FOUR-HORSEPOWER ENGINE, $131 and up, depending upon equipment.

"NAUTILUS," 20 FEET IN LENGTH, EQUIPPED WITH A TWO CYLINDER EIGHT-HORSEPOWER ENGINE, $198 and up.

Write for our "FIREFLY" pamphlet telling all details.

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ELASTIC FLAT YACHT WHITE Two coats last all season.. Price $3.00 per gal. $1.00 per ½ gal.

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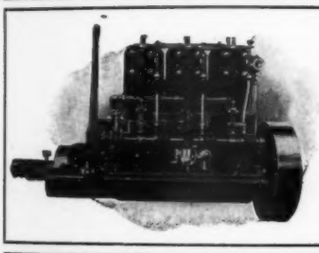

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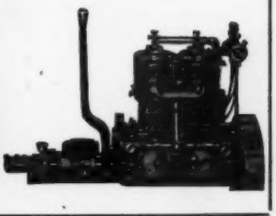

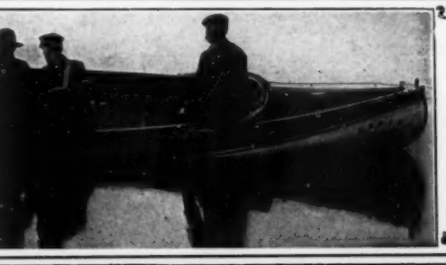

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are made of the best cedar, ribs and planking covered with canvas; spruce gunwales, white ash or oak stems and thwarts and brass-bang plates. The seams are beveled and lapped, making a smooth water-tight canoe, even before the canvas is put on. No cracks, no swelling or shrinking and the result is a stiff, strong, durable canoe. Ask for our descriptive booklet.

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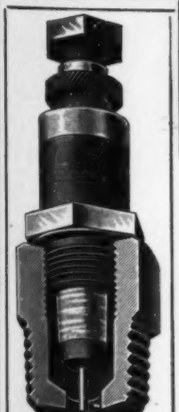

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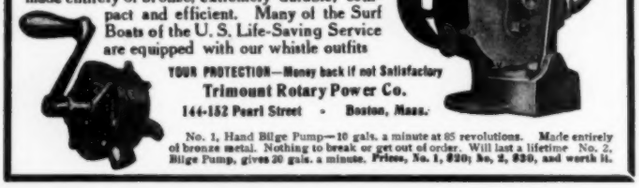
FOR THE DISCRIMINATING YACHTSMAN AND MOTOR-BOATIST

A rotary blower driven by friction with fly-wheel of the engine. NO TANKS---NO TROUBLE ---NO DANGER with Trimount Blower Outfits. Can be heard at a great distance, and the blast is maintained as long as driving wheel of Blower is in contact with fly-wheel of engine. No variation or falling off in tone as with compressed air system. Made in three sizes.

Very simple, nothing to get out of order. Whistle can be placed on deck wherever required and the pull can be located in any part of boat. Blower is made entirely of bronze, extremely durable, compact and efficient. Many of the Surf Boats of the U. S. Life-Saving Service are equipped with our whistle outfits

Trimount Rotary Whistle Blower, $15.00 AND UP



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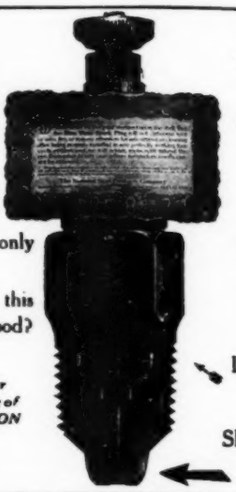
No. 1, Hand Bilge Pump—10 gals. a minute at 85 revolutions. Made entirely of bronze metal. Nothing to break or get out of order. Will last a lifetime No. 2. Bilge Pump, gives 20 gals. a minute. Prices, No. 1, $20; No. 2, $30, and worth it.

Guaranteed not to be taken from your cylinder for the entire year



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Mica only $1.00

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See the Inner Shell

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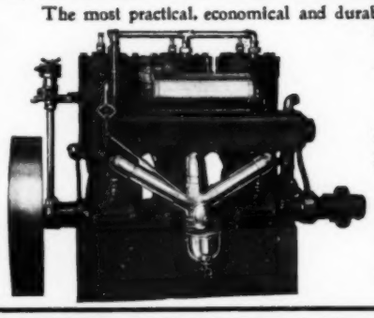
2½ to 28 H.P. Medium and Semi-Speed Models

The most practical, economical and durable motor on the market at the present time.



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Marblehead Anti-Fouling Green & White

ONLY ONE REASON WHY

we ask you to use it—it's the best—and that's also the only reason why we ship it to all parts of the world. For nearly twenty years we have manufactured and constantly improved this anti-fouling composition, and ***used it at our own yards*** where we have painted hundreds of launches, yachts and vessels. We have tested it year after year in actual service with practically every other composition produced. A beautiful color—long life—powerful anti-fouling qualities—saves $30 on an average small 30-footer in one season. Full directions for using on every can.

Yacht White and Black for Topsides—Marblehead Spar Varnish

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This is one of THE HYDE METAL BOATS

Sensation of the Season.

A 5 Piece, Knocked Down, Sheet Metal Boat.

Formed by our new process, completely set up in shop, every part accurately fitted.

Guaranteed to assemble quickly and easily

Large variety of sizes

Write for information to

HYDE METAL BOAT CO. Watertown, N. Y.

Fittings for the Boat

MORSS Goods have been the standard for boats for over 60 years. Everything you can possibly need.

Send for catalog showing complete line, enclosing 6 cents for mailing.

Special fittings made to order.

Agents for leading specialties, such as:

HALL Anchor	*CAVITO Exhaust*
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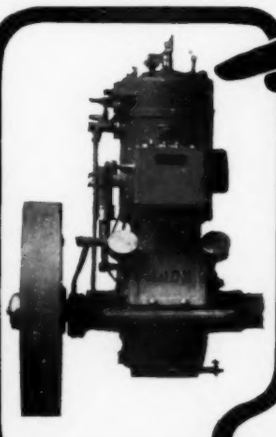

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The Reliable Motor with the Power

Remember the Motor is the Heart of your boat, Do not consider first cost only. Buy a Reliable and Powerful Motor so you can have the pleasure with your boat that you are expecting. The KNOX will give this to you.

Sizes—2½ H. P. to 40 H. P.—Two- and Four-Cycle.

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Camden Anchor-Rockland Machine Company, Camden, Maine, U. S. A.

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Every Dealer, Boat and Engine Builder in the world to send your name and address and receive (free) our

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just issued, the largest and most complete up-to-date line of Marine Hardware ever issued. We will also, mail this mammoth catalog to anybody interested in Motor Boat Supplies on receipt of 20c. to cover postage.

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TWO SOUTH STREET
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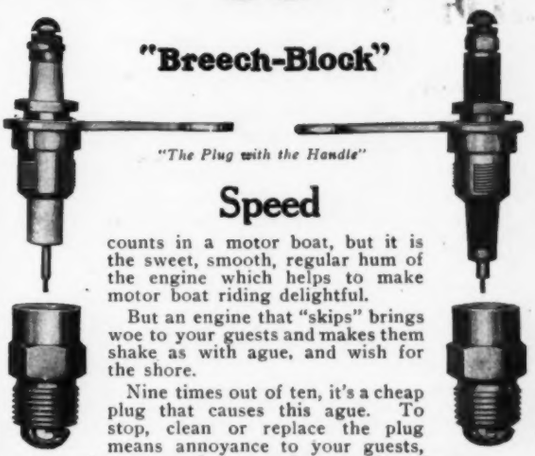
"Breech-Block"



"The Plug with the Handle"

Speed

counts in a motor boat, but it is the sweet, smooth, regular hum of the engine which helps to make motor boat riding delightful.

But an engine that "skips" brings woe to your guests and makes them shake as with ague, and wish for the shore.

Nine times out of ten, it's a cheap plug that causes this ague. To stop, clean or replace the plug means annoyance to your guests, and unpleasant monkey wrench contortions for you.

Wise motor boat men, however, never get caught. They use only **"Breech Blocks"** which have chambered ends to keep out the soot and oil.

None but the brain-sick can fail to appreciate what it means to be able to pick out your spark plug without tools as you would pick out your watch—with the whole insulator exposed for easy cleaning—to clean it with a single twist—drop it back in place, locked tight, in less than six seconds.

You can put in a new plug with the same ease—without stopping the engine, if you carry an extra one with you.

All threads; Mica $1.75, Porcelain $1.50. At dealers, or postpaid. Send for booklet.

Earl Canedy

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A New 35x9 Foot Truscott Cruiser

A 35 x 9 foot roomy and seaworthy cruiser, with many features that will appeal to the experienced. Members of our firm have tried out this craft in actual service,—a total of six weeks' cruising. Nothing about it that is experimental.

The 9 foot width insures a roomy boat, therefore a comfortable one. There are two sleeping compartments separated by a toilet room, the latter being accessible from either sleeping compartment without disturbing the occupants of the other. Exceptional locker and wardrobe space is provided as well as a convenient arrangement of galley and folding table.

The cockpit has a wide lockered thwart seat with high back and space for four or five rattan chairs.

The motor installation consists of a four-cylinder four-cycle Truscott 21 H. P. motor, with dual high-tension magneto ignition, mechanical oiler, etc., an ideal power for a cruiser. The control of boat and motor is in the hands of one man. Salt water equipment throughout. Mahogany and white enamel finish.

THE PRICE is exceptionally low, based on the construction of no less than ten exactly alike for 1910 delivery. Better look into this,—it offers a big value.

Our general catalogue A illustrates and describes our entire line, except above craft. Ask for special literature if interested in it.

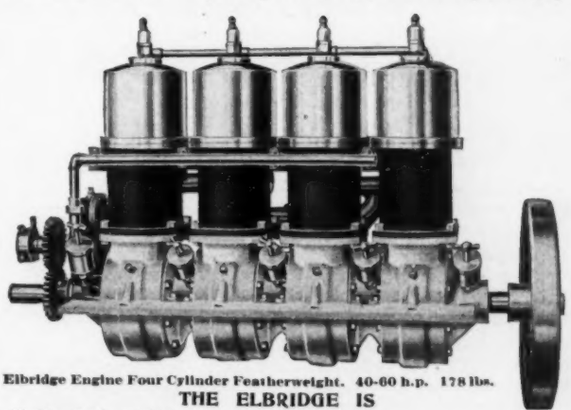
TRUSCOTT BOAT MFG. CO.

Box 8, St. Joseph, Mich.

Branches with stock in New York, Boston and Chicago

First at the Finish—Elbridge Engines

Your boat, equipped with the right Elbridge Engine will give you more and better service at less operating cost than any other outfit you can buy



Elbridge Engine Four Cylinder Featherweight. 40-60 h.p. 178 lbs.

THE ELBRIDGE IS

Simple—fewer working parts than any other.
Light—less weight to carry, less displacement of water.
Carefully built of the best obtainable materials.
Made in seventy-five styles and sizes. The exact motor your boat needs to give maximum satisfaction is here for you.
Write our Information Bureau for facts and figures on Marine and Aeronautic navigation. They'll interest you. Catalogue for the asking.

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Let the Spray Splash Freely

Over a Royal Igniter

It Won't Short Circuit. It Cannot Stop

THE ROYAL ENGINE

Of course we don't think you're going to pick out the rough days to go out, but once in a while you are liable to be caught.

This satisfaction means much to you. It is only one point of ROYAL superiority. Our catalogue deals with each individually. Send for it.

The Royal Engine Co.

117 Housatonic Avenue :: Bridgeport, Conn.

Did You Ever Hear of an Oil Engine?

Did you ever hear that they would fill your cabin with a stench?

Did you ever hear that they were not reliable?

Did you ever hear that they stuck up with carbon?

Did you ever hear that Kerosene was just as dangerous as gasoline?

Would you like to know the truth on the above matters?

If you would, ask the

Remington Oil Engine Co. of Stamford, Conn.

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Sawyer's Excelsior Brand Oilers

For Yachting and Boating, including the Life-Buoy Oilers for Men and Women

Every yachtsman realizes how helpless a person would be in the water clothed in an ordinary waterproof garment. The Life-Buoy Oiler eliminates this danger, and instead of the garment being a burden it acts as a life-preserver, for with the air chamber slightly inflated, it is impossible for a person to sink.

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The Aaron Automatic Bilge-Pump

Operated by the cooling water after it leaves the engine cylinder.

No moving parts. No check valves. Nothing to wear out.

Pumps sand or grit out of bilge. Positively automatic.

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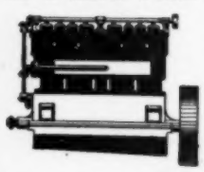
"The quality goes in before the name goes on."

Boulevard (4 Cycle) Engines



4 Cyl. 20 H. P. $200. 4 Cyl. 40 H. P. $300
8 Cyl. V. 125 H. P. Price on Application

Special Light Weight Engines for Racing Boats

25-30 H. P. Weight 80 lbs. - - $285
50-60 H. P. Weight 140 lbs. - $400

Before you buy your engine don't fail and send for our Catalogue and our perfect oiling system, for we are making better Motors for the Money than any Competitor—That is Our Aim—And WE DO IT.

Agents Wanted the World Over

BOULEVARD ENGINE CO.

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The

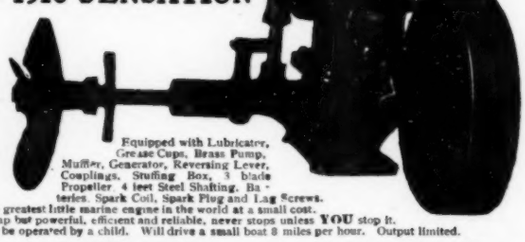
COX, JR.

1 to 1 1-2 H. P.

A 1910 SENSATION

$30.00

$4.80 extra for salt water fittings



Equipped with Lubricator, Grease Cups, Brass Pump, Muffler, Generator, Reversing Lever, Couplings, Stuffing Box, 3 blade Propeller 4 feet Steel Shafting, Batteries, Spark Coil, Spark Plug and Lag Screws.

The greatest little marine engine in the world at a small cost.
Cheap but powerful, efficient and reliable, never stops unless **YOU** stop it.
Can be operated by a child. Will drive a small boat 8 miles per hour. Output limited.

AERONAUTIC MOTORS
R. WILCOX, *Manufacturer*

Write for descriptive booklet
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EFFICIENCY RELIABILITY DURABILITY

THE NAME MEANS IT

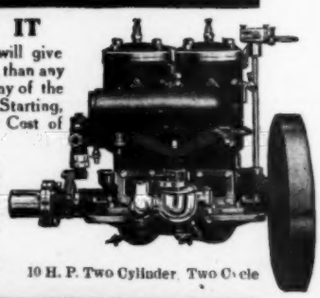
—You want POWER, and ERD Motors will give you more power, bore and stroke considered, than any engine manufactured, without sacrificing any of the essential features, such as Control, Ease of Starting, Accessibility to Every Working Part, Low Cost of Maintenance, Etc.

—It is a significant fact that every boat equipped with an ERD is a Winner. There is not a two cycle motor manufactured to-day that contains the improvements and features offered in 1910 ERD Motors.

High and medium speed Two-Cycle Motors manufactured from 3½ to 60 H. P.

Heavy Duty Four-Cycle type from 12-40 H. P.

Write for free catalog to-day, stating H. P. and type of engine wanted.



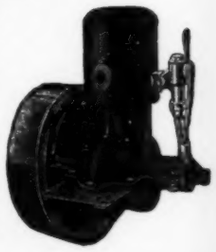
10 H. P. Two Cylinder, Two Cycle

ERD MOTOR CO. SAGINAW, MICH. U. S. A.

—BELLE ISLE—

MARINE ENGINES

The simplest, staunchest, swiftest, most powerful and efficient 2-cycle engine of its size built. Perfect and refined in every detail. Makes speedy launch out of ordinary canoe, row boat, skiff, yacht tender. Great for hunting, fishing and flat-bottom boats, and 14 to 20 feet speed launches.



2 Actual H. P. Bare Engine $23

Complete Engine with Accessories and Fresh Water Boat Fittings, $42.00. Salt Water Boat Fittings, $4.00 extra.

Anyone can install and run. Compact, strong, durable, reliable, reversible, economical, safe. We also make up to 10 H. P., one and two cylinders. Sold direct from factory to user. Fully guaranteed. 30 days approval. Prompt shipment. Order now.

NEW BELLE ISLE MOTOR CO., 12 Motor Boat Lane, Detroit, Mich.

ANTI-CRANKING FEATURE

—IT'S NEW

Another Lackawanna Simplification

RESULTS FROM Gravesend Beach, N. Y.

Gravesend Beach, Brooklyn, N. Y., Nov. 8, '06.

Lackawanna Mfg. Co., Newburgh, N. Y.

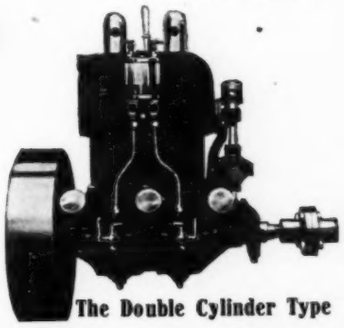
Gentlemen:—I have used the Lackawanna 30 H. P. engine in a 50 ft. boat; have been to sea and have encountered all kinds of weather, and have found it without an equal. As this is the only engine I have found on which I can rely, I wish to thank the Lackawanna Engine Co. for introducing it into this part of the country.

Yours very truly,

WM. KENNEDY.

Lackawanna Valveless Motors

The World's Simplest



The Double Cylinder Type

The "En-Bloc," one-piece cylinder construction, results in increased efficiency, perfect cooling, economy in gasoline, freedom from vibration and long life. Our motors are *guaranteed*.

Built in one, two, three, four and six-cylinder, 2 to 45 H. P. per motor, either jump or make and break low tension spark for battery or magneto; also *electric light, pumping, refrigerating, and stationary motor plants.*

Perhaps it would be well to get our complete "Marine Motor Book" explaining the operation of boat motors from Intake to Exhaust. Fully illustrated, also with latest practical boat equipment details.

Sent free to any part of the world. Write for it to-day.

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Puts Fire Out

Instantly—no matter whether it is gasoline, oil, or the most inflammable thing known.

"PYRENE"

It will even put out an electric arc.

You should have one in your boat or auto—hundreds of other owners have. It is approved and used by the New York Fire Department and in the United States government service.

Pyrene is a chemical fire extinguisher that will not freeze, never loses its strength, will not injure anything it is thrown on, requires no attention or recharging until entirely used, instantly **smothers** any kind of fire, and is absolutely a non-conductor of electricity.

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Don't buy an engine or a boat on promises.

Don't listen to talk about what the engine will do. Find out what it has done.

Compare the actual History of the engine and boat you thought best with that of the

ROCHESTER

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Find (if you can) an engine of corresponding price whose record can equal the Rochester's.

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1910 models, one to six cylinders, 4 to 48 H.P. Immediate deliveries. Mechanical oilers. Atwater Kent Ignition. Gasolene or kerosene.

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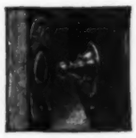

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It sets flush with the wood and always works easy and automatic, with no projections to be knocked off

Patented in the United States and Foreign Countries

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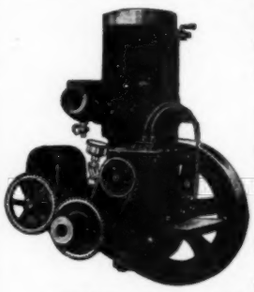

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PASSES THE GOVERNMENT TEST
A 7½ H. P. Mianus develops 8.41 H. P.

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THE MIANUS GENERATES ITS OWN ELECTRICITY
and requires
NO BATTERY NO SPARK COIL

BUILT TO LAST A LIFE TIME
Sizes 3 h. p. to 15 h. p. *Cat. Free*

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From Smallest to Largest They're T & M Quality Throughout

T & M quality, the standard by whom others are judged, goes into every one of our engines no matter what its size—

That is one of the reasons why these engines have won the approval of conservative buyers all over the country.

Compare the T & M with any other engine on the market—you'll find its ratings honest and its dimensions most liberal. Our 3 h p. engine is larger in bore and stroke and has a larger crank and propeller wheel than the 4 h. p. engines of most other makes.

The T & M is a splendid working engine—an engine that with proper care never misses an explosion. As long as a T & M owner has gasoline and current he need fear to go no where.

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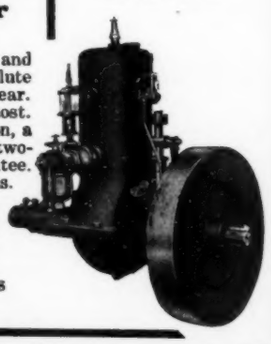

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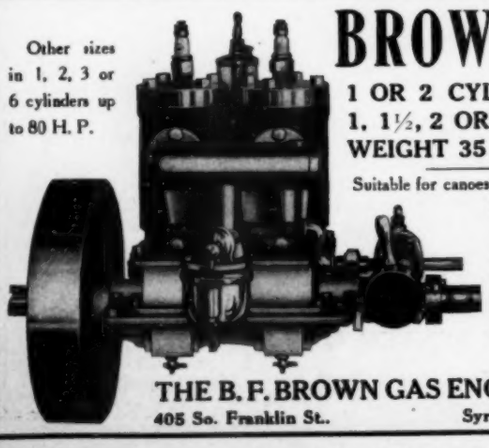

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1 OR 2 CYLINDERS
1, 1½, 2 OR 3 H. P.
WEIGHT 35 – 50 lbs.

Suitable for canoes, yacht tenders, skiffs, etc

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CACO ADJUSTABLE CHIME $5.00

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IT'S THE CACO MAKES HIM SMILE

BECAUSE IT MAKES MORE NOISE THAN THE OTHER FELLOW'S WHISTLE

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"The Acetylene plant you installed in the "Hawoit" (a 111-ft. boat) six years ago has been in constant use ever since then and has given absolutely no trouble. I have had your system installed in a number of other yachts with equally good results, so I do not hesitate to recommend it to any of my clients who consult me on the subject."
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has the sanction of the National Fire Underwriters and the U. S. Steamboat Inspection Service; is used in the boats of the U. S. Revenue Cutter Service, the Coast and Geodetic Survey, the Department of Commerce and Labor, and by hundreds of the most prominent yachtsmen in the country. Our catalogue tells the advantages of the *Safety Storage System* over all other forms of boat-lighting. Drop a postal for a catalogue—now.

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That's a long time, but it's a guarantee that we've never been asked to make good on.

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Our motors have all the accomplishments of their more complicated competitors, on less than one-half of their parts. There is absolutely no reason for loading a motor down with levers, push-rods, valves, etc., if you know how to do the trick without. Write for Bulletin J-5006 for information on the above motor.

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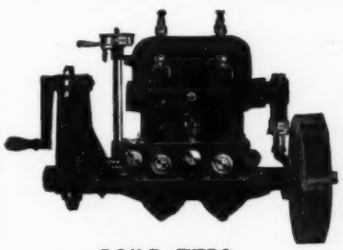

5-6 H.P. TYPE C.

LOCKWOOD-ASH MOTOR CO.
230-50 HORTON STREET, JACKSON, MICHIGAN, U. S. A.

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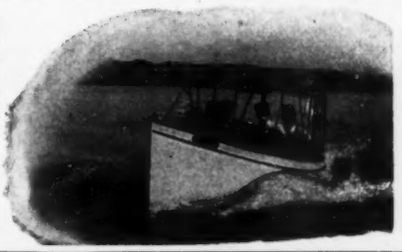

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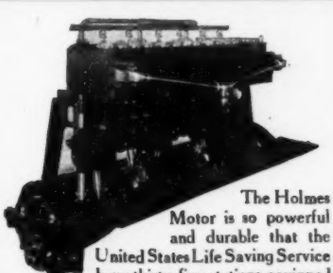
THE MOST POWERFUL REFINED & DURABLE ENGINE MADE



The Holmes Motor is so powerful and durable that the United States Life Saving Service have thirty-five stations equipped with Holmes Motors, and ten more ordered.

It is accessible in every part, and has a long stroke, great flexibility, compactness of design, and a positive lubrication system.

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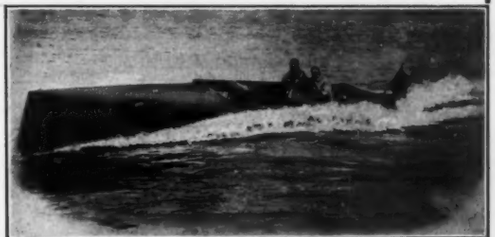

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The Worlds Standard Two-Cycle Engine
ADVERTISING DEPARTMENT

CLEVELAND, O. U.S.A. 4-29-10

Motor Boating

1789 Broadway

New York.

APR 30 1910

Gentlemen;-

We are pleased to inform you that we have been so well pleased with the results we have been receiving from our 1/8 page advertisement in "Motor Boating" this season, especially during the last few weeks, that we have concluded to use a half page for your May issue at least.

You may consider this letter authority to run 1/2 page for May. You will find copy enclosed. Cuts will go forward tomorrow, under separate cover and we trust they will reach you in ample time.

We have received inquiries regarding the Ferro Marine Engine from all parts of the United States as well as Canada andsome from abroad, which makes us feel that your publication is one of the best mediums we can use to tell the world that the Ferro is the world's Standard Two Cycle Motor.

Trusting that you will be able to submit proof for our approval, we remain,

Yours very truly,

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In 3 sizes—see Price List

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Adjustable to various angles by Ratchet and Nut at back. In general appearance it closely matches many makes of speedometers. In 3 sizes—see Price List.

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Secured to Dashboard by Safety Locking Device.
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The Illustrations below show the (patent applied for) STEM WINDING and STEM SETTING Device

On Models A, B and C it projects through side of case. On Models D and E it projects through bottom of case and eliminates seconds dials. Compact and effective. IF CLOCKS wanted FITTED with this device, ADD $2.50 to Price Lists.

PRICE LIST

SIZE	MODELS A, B, C	MODEL D	MODEL E
3-inch.....	$15.00	$18.00	$21.00
3½-inch.....	16.50	21.00	24.00
4-inch.....	18.00	24.00	27.00

Add $2.50 to above prices if wort fitted with the stem wind and stem setting device.

In ordering, state the model and size wanted.

The movements are 8-day, high-grade, very rigidly built, are 7-jeweled and have Breguet hairsprings and compensation balances with timing and balance screws, etc., and are secured by screws through back of case—the best possible way.

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Sturdy Enough for the Fisherman

The fisherman, who goes out in any and all kinds of weather, day and night,—winter and summer,—puts his engine to the severest test possible.

His very livelihood depends upon the reliability of his motor, and he MUST have an engine upon which he can depend at all times and seasons, and under all conditions.

Do you want a better recommendation than this for the engine for your Motor Boat?

Handsome Enough for the Finest Pleasure Boat

Remember, Mr. Boat-Owner, that while you do want an engine upon which you can depend, and which will stand up under all possible hard knocks, you do not want a rough looking, uncouth mass of metal to put in that handsome new boat of yours, and just because the KENNEBEC stands hard usage and exacting conditions, do not fancy it is a "rough jewel." It runs more smoothly and is the most completely equipped motor that you have ever seen, splendidly finished and in any size exceeds its rated horse-power from thirty to forty per cent.

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A Book of Vacation Facts
that will give you a clear conception of where to go, where to stay, how much it will cost and what to see in
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You cannot afford to be without it.
IT'S FREE FOR THE ASKING.
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LET US KNOW YOUR WANTS TODAY.
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They work easier, last longer, and require less care than any other closets on the market.
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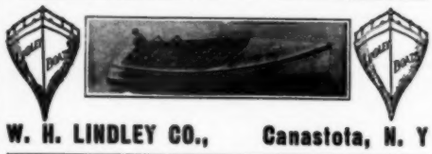

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Ask the man who owns a
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In the meantime send for Catalog
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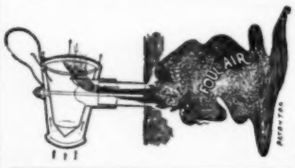

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JUST LOOK! One of these 18 ft. sail and rowing dories, complete, for $65, the safest boat afloat. Price includes boat with centerboard, rudder and tiller, sails and spars, one pair of oars and rowlocks. The same boat with 1½ H. P. motor without sails for $150.
As we can build only 200 of these boats this season, first come, first served. Send 25% of purchase money today with order and get one of the best little sailing boats ever built. Thirty-three years' experience in building these boats. We build all kinds and styles. Send 6 cts. in stamps for Catalog "M."
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"The Best in the Bunch"
Makes boating a real pleasure by eliminating Noise! Smoke! and Smell! 1¼-in. Bronze, $4.50. 1½-in. Bronze, $5.50. All jobbers.
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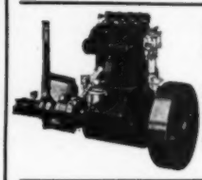

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Four Cycle. 3-60 H.P. 1-6 Cylinders
Simplest high-grade power plants on the market. Materials and workmanship the best obtainable. Our guarantee a liberal insurance policy.
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Finished Die Moulded **CASTINGS**
Timer Parts and Bearings Our Specialty
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Safe. Best Sea Boat Built. $125 up. Send 4c. in Stamps for Catalog.
KNOCK DOWN DORIES, EASY TO BUILD
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BUILDERS OF ALL TYPES OF POWER BOATS, SAIL BOATS AND DINGHYS. MARINE RAILWAYS, REPAIRING AND SUPPLIES
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New Stock designs of 20 and 25 foot semi-speed boats now ready with material and workmanship up to the usual high standard of our built to order boats. Knockdown frames of these can also be supplied
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14 ft. Launch Complete with Engine Ready to Run **$94.50**
16, 18, 20, 23, 27, 28 and 35 footers at proportionate prices, including Family Launches, Speed Boats, Auto Boats and Hunting Cabin Cruisers of the latest design. Sixty-four different models in all sizes ready to ship, equipped with the simplest motors made; start without cranking; ten-year-old child can run them. Boats and engines fully guaranteed. Let us send you testimonials from some of our 12,500 satisfied owners. We are the world's largest power boat manufacturers. Our free consultation department can give you valuable, money-saving information. Write today for Free Illustrated Catalog and Demonstrating Agents' Proposition. 620
DETROIT BOAT CO., 1147 Jefferson Ave., DETROIT, MICH.

The Havana Race.

(*Continued from page 5.*)

engineer; and Rufus Lennig, Richard Mitchell, Dr. Ward Brinton, Henry Bowes and Charles Curran, crew.

It is expected that the boats will all arrive at Havana within six days after the start. This will land them there on May 27. The return race, which is to be run from Havana to Atlantic City, will not be started until after the middle of June, and it is planned to make a course for Key West where gasoline sells for 10 cents a gallon.

The three massive cups offered as prizes for the race, two of which are being made by J. E. Caldwell & Co., are appropriate in design. They are valued at $1,000, $500 and $250, respectively, and as this had to represent actual cost, the cups are of exceptional weight and dimensions and of exquisite workmanship. Each of these prize cups will be accompanied by a cash prize of equal value. The safety of the crews of the boats was the principal thing to be treated with in the eyes of this committee and a set of rules to accomplish as far as possible that end was formulated as follows:

Boats.—Open to seaworthy boats not over 100 feet over all and not under 50 feet over all. (A seaworthy boat is a substantially built, full decked vessel, having engine and living accomodations housed in and being equipped with all tackle and appliances necessary to enable her to perform a long passage in open water.)

Rating.—Will be calculated under the 1909 rules of the American Power Boat Association with full time allowance.

Propelling Power.—Any form of internal combustion engine may be employed for propulsion purposes.

Fuel.—The Regatta Committee assumes that those entering the race have a thorough knowledge of the fuel necessary to make the passage, and therefore does not specify any quantity. No ingredient shall be used to increase the power of the fuel.

Sails.—Boats must be equipped with suitable spars and rigging to carry sufficient sail to give them steerage way in a moderate breeze. This sail can be spread in any shape, but must not exceed in square feet the square of the over all length divided by eight as a constant.

Stores and Water.—Stores and water sufficient for 30 days for each man must be carried.

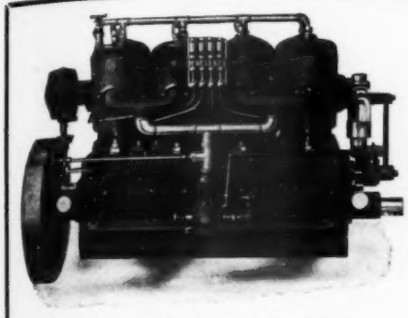
Crew.—No boat will be allowed to start with less than 6 men aboard, one of whom shall be a practical navigator and one a practical engineer.

Equipment.—A boat or life-raft must be carried of sufficient buoyancy to sustain the whole crew or else two boats or a raft and a boat. Also a ring buoy or life jacket for each member of the crew. A full set of navigating instruments, a spare compass, sea-anchor, oil bags, chain cable and at least one gallon of crude oil and fire extinguishers must be carried. Suitable arrangements for fitting an emergency tiller must be made. An assortment of spare parts and gear to the satisfaction of the committee must be carried. All boats must be equipped with the fittings and appliances prescribed by the U. S. Government.

Tanks.—Fuel must be carried in at least two separate tanks. Fuel for lighting or cooking purposes may be carried in separate receptacles. Water must be carried in at least two separate tanks, all tanks to be securely fitted and fastened to the hull of the vessel to the satisfaction of the committee.

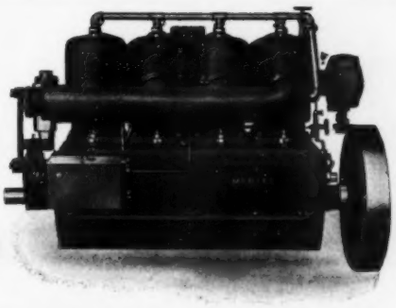
Protests.—Protests covering violations of sailing rules must be made in writing within 24 hours after the finish of the race. Protests regarding ratings must be filed in writing with the Regatta Committee previous to the start of the race.

Coston Night Signals will be supplied to each boat to distinguish them when passing lightships or other vessels. Arrangements will be made to give a clean bill of health at Philadelphia the day of the race. No other papers will be necessary to enter the port of Havana.



DOMAN

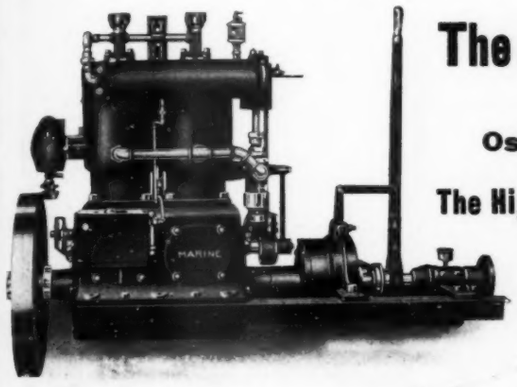
"The Motor of Quality"



Port View, 30 H.P. four cylinder Doman Marine Motor

Starboard View, 30 H.P. four cylinder Doman Marine Motor.

We have been building Marine Gasoline Motors and Engines of the four cycle type for the last fourteen years. We build them in sizes from 5 to 200 H.P., 2 to 8 cylinders. They are the product of a gradual refining process. In their present state they approach the highest degree of development in the marine construction line. It means that you secure power that will give you satisfaction at *all times*. In short quality through and through. Write for catalog.



The H. C. Doman Co.

Dept. "F"

Oshkosh, Wis., U.S.A.

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Western Stock Branch

Seattle, Wash.

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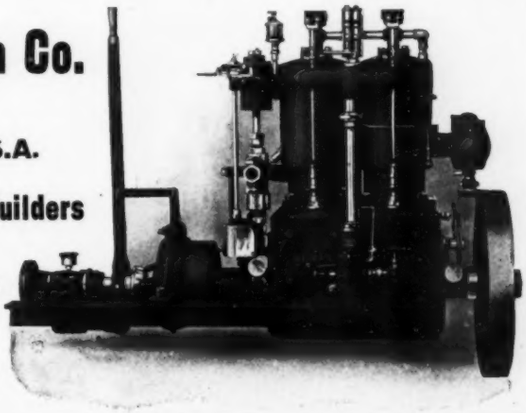

Port View, 20 H.P. two cylinder Doman Heavy Duty Marine Engine.

Starboard View, 20 H.P. two cylinder Doman Heavy Duty Marine Engine.

Investigate All--You'll Decide On a Thrall

GET ALL the facts about all motors. Take note of every feature, every advantage of each. Think what those features and those advantages mean to you. Then decide on the one that is best. You will get the right motor if you investigate thoroughly. The more you know about motors, the better you will like a Thrall Refined. That is why we invite close comparison. For then you will know the Thrall advantages in speed, simplicity, economy, durability and strength over *all* motors.

This Is the Famous Thrall 3 H. P. Refined

Mail the Coupon for the Best Book on Motors

Although the Thrall owners have the fastest boats, speed isn't the sole reason for buying a Thrall. Let us tell you all the reasons. It's worth your while to investigate. Read its record: The "Limit," the fastest boat of its size and power in the world, is equipped with a Thrall. So is "Bub," the boat that went 310 miles in 25 hrs., 10 min. Thralls are made in sizes from 3 to 12 H. P. The 3 H. P. Thrall weighs only 60 lbs. Its record proves that excessive weight is unnecessary for speed, power, endurance or durability. The facts are interesting. Our book will tell you about the motor that insures the most motoring pleasure. Mail the coupon now.

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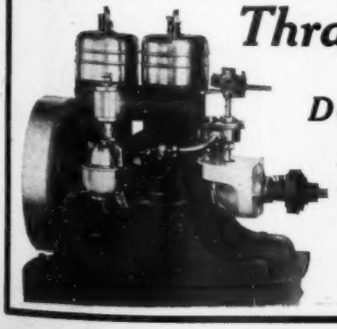

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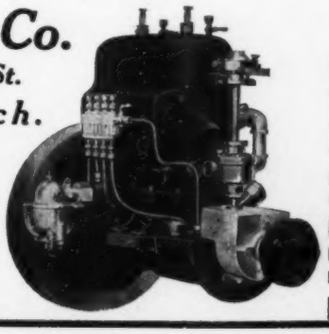

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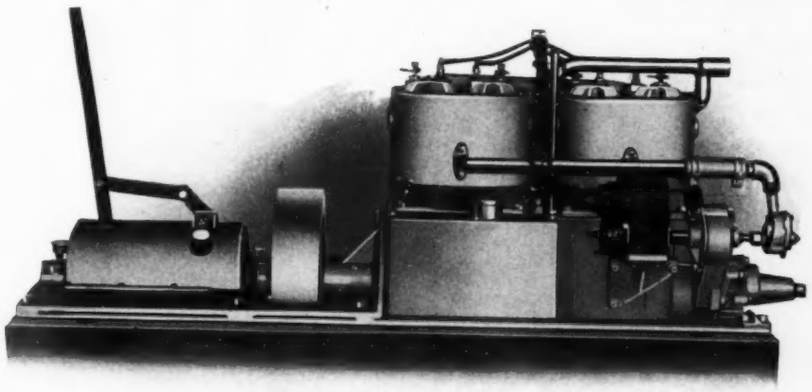
Originators of the Pattern and Knock-Down System of Boat-Building.

Established 1901

Oakland 20-32

The OAKLAND 20-32

Oakland 20-32



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The strongest pulling engine of its inches in the world

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12-in. Pol. Brass Steering Wheels	$1.50
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EFFICIENT BOAT ACCESSORIES

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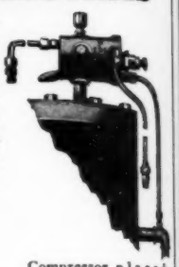
Approved by Government inspectors, and recommended by the best engine and boat builders everywhere.
Refined, Perfected and built to give Perfect Satisfaction under all conditions. The Comfort, Safety, Elegance and Pleasure of Boating is not fully enjoyed until our equipment is installed.



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3-way valve permits closing off gasolene draining filter, or filling cup for priming. Screens may be removed without disturbing piping. Price $1.75.

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MADE OF OUR FAMOUS MANGANESE BRONZE—A Wheel for Every Boat
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Four-cylinder; bore, 4½ inches; stroke, 4 inches; diameter of flywheel, 14 inches; height of engine over all, 20½ inches; distance from bottom to center of shaft, 4½ inches; size of base, 36 x 16 inches; horsepower, 25 to 30; diameter of crank shaft, 1⅜ inch; length of shaft over all, 44 inches; weight of engine, only 325 pounds; revolutions per minute, 100 to 1,000; diameter of propeller, 19 to 26 inches. Aluminum intake manifold; brass water manifolds; iron exhaust manifold.

We make **Model A** in 1, 2 and 4 cylinders.

Model A motors are used in pleasure boats, speed boats, ferry boats and tugs, as well as working boats owned and employed by the U. S. Government in river and harbor service.

Run all day without trouble. Exceedingly economical with gasoline and oil, and give the power—not a rated power, but an absolute power that you can depend upon.
Send for Catalog A, also for Catalog C, showing our famous Outboard Motor—and Catalog of "Special Speed Canoes."

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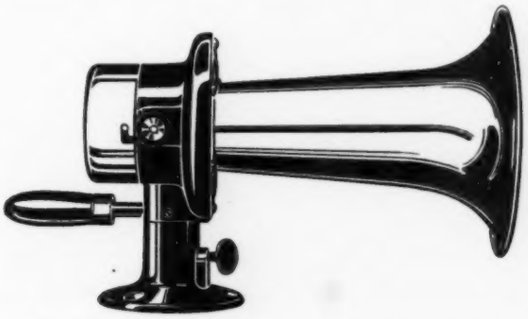
Buy only advertised goods.



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COMPLETE with Wire and Push Button

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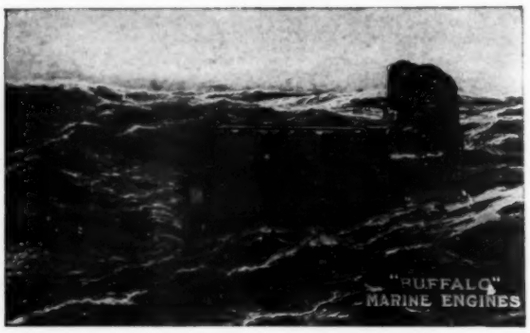

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There are twenty-two BUFFALOS—from 2 to 225 H. P., and from 1 to 8 cylinders—in Regular, Heavy Duty and High-Speed Types

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IN EVERY LAND AND ON ALL WATERS, BUFFALOS made good—because we made them best. We put lots of money into their making, to make them make lots of money for us.

It's just our business policy—started a dozen years ago—to make better profits by making best engines. It's been good for us and good for you.

We frankly admit we didn't establish this policy of making BUFFALOS better than the rest, for your benefit. It was merely a dollar-getting business plan on our part.

As a secondary consideration it benefited the buyer. Under this plan of building them up to the highest possible standard, BUFFALOS everywhere have proven their worth—in result-showing service—thus speaking eloquently for themselves, which is better than having the uncorroborated advertising man speak for them.

We certainly would be foolish to give up our profitable policy of making BUFFALOS just the best that is possible. No business man abandons a money-making method. Wherefore we repeat our creed:

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Improved construction, always. But no better materials, or equipment, until science discovers them.

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Sizes 4 Cycle Engines

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3 Cylinder, 18 H. P.	4 Cylinder, 40 H. P.
4 Cylinder, 24 H. P.	6 Cylinder, 60 H. P.
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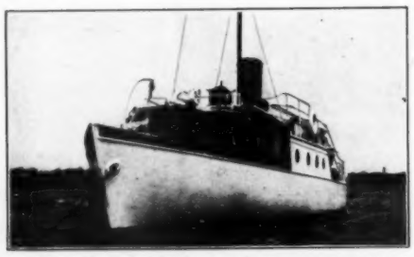
Special Racing Engines to order only in 4, 6, 8 and 12 Cylinders



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This vessel is credited with the fastest time ever made by a motor-driven craft from St. Augustine, Fla., to N. Y. City.

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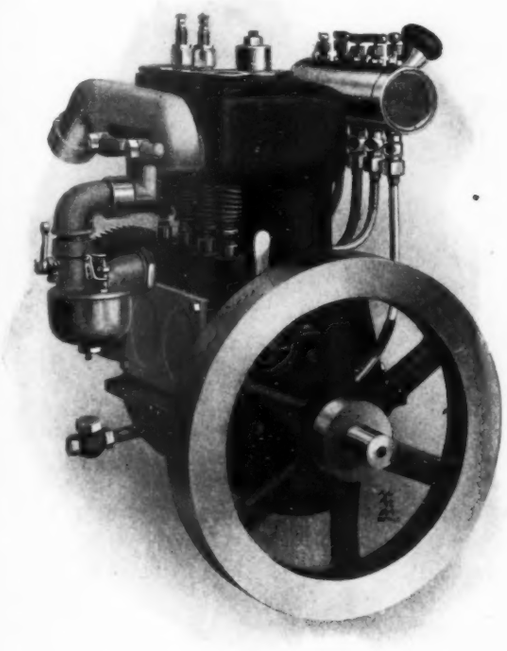
Reliability - Endurance Wins



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Manufactured by Grimm Mfg. Company.

NO MATTER how perfectly you have designed your hull;—no matter how convenient everything is arranged;—no matter how luxurious and comfortable it all is—you will get little pleasure or comfort unless the heart of your hull—your engine—is right. Your pleasure and the pleasure of your guests, your safety and the safety of your guests, all depend upon its reliability—its endurance. Equip your boat with

The Grimm Motor

and you experience that feeling of security which makes boating the ideal pastime.

The **Grimm Motor** is one of the lightest four-cycle motors built, the two-cylinder type weighing but 150 pounds. No strength is sacrificed to lightness. Every part is tested for strength beyond its requirements.

Every working part is of material selected especially for fitness to satisfactorily perform the work. Every part is accurately machined and fitted, and before used is tested for strength. All bearings are extra long and lined with the best babbitt, insuring smooth operation with least friction and wear.

Grimm Motors are built with 2, 4 or 6 cylinders, cast in pairs. Power ratings: 2 cylinders, 6-8 Horsepower; 4 cylinders, 12-16 Horsepower; 6 cylinders, 18-24 Horsepower.

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Think of the ordinary kind of marine motor and then think of the finest automobile motor you know about. That's the way to picture in your mind the difference between the ordinary motor and the Scripps.

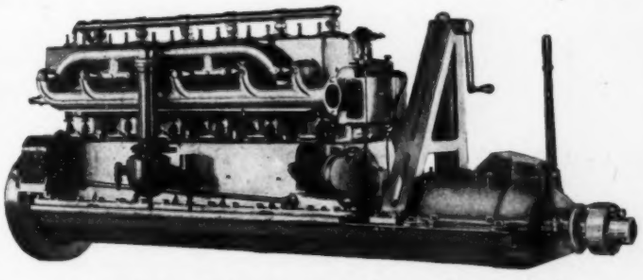
Choice of materials partly accounts for this superiority; refinement of detail and the more than ordinary refinement of manufacturing process, puts it along in the field.

All Scripps motors are four-cycle in type, and are made for every purpose, and every size of boat. Our catalog shows the full line of Scripps motors, from four to one hundred H.P., one to six cylinders. Not only are the motors fully described and illustrated, but the careful process of manufacturing is described in detail

Write for a copy to-day.

Scripps Motor Co.

651 Lincoln Avenue **Detroit, Mich.**



Six-cylinder Scripps motor, with reverse gear and rear starting device mounted on sub-frame. Can be arranged for bulkhead control if desired.

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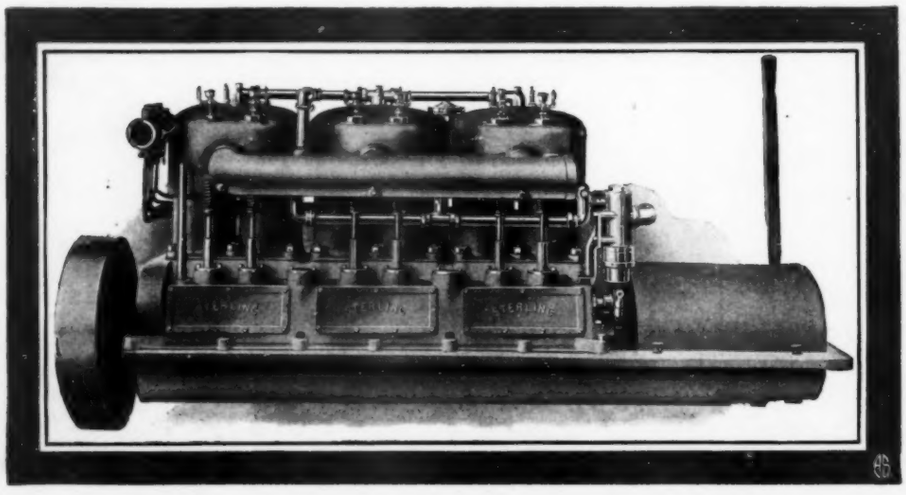
RELIABILITY AND ENDURANCE DEMONSTRATED

ENGINES OF REFINEMENT TO MEET ALL MARINE REQUIREMENTS
FOR CRUISERS—LAUNCHES—RUNABOUTS—SPEED AND WORK BOATS
DESCRIPTIVE CATALOG WILL BE SENT UPON RECEIPT OF YOUR REQUEST



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SEMI HEAVY DUTY 18 - 25 - 30 - 35 - 45 HORSE POWER	FOR SPEED 25 - 40 - 45 - 55 65 - 100 - 180 - 240 HORSE POWER	FOR HEAVY DUTY 8 - 12 - 18 - 40 - 60 HORSE POWER

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